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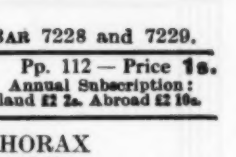

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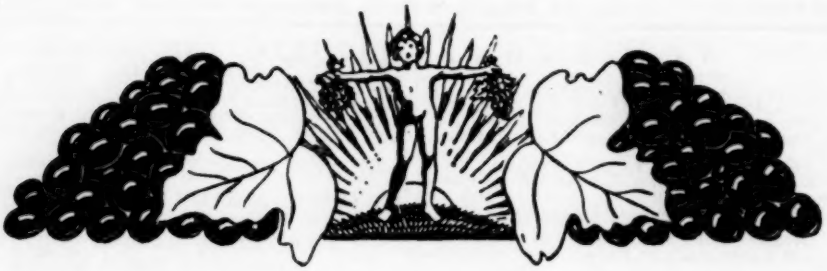

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THE facts of Harvey's life have often been recited within these walls and are well known to you. His fame rests upon two achievements. He rendered the College of Physicians manifold services for half a century, and left it precious legacies and benefits. And by his discovery of the circulation of the blood, which Sir Thomas Browne preferred to the discovery of America, he became the founder of modern physiology. He it was who opened wide for the science of medicine the gates of the Renaissance and revealed, like Copernicus, a new orientation of human thought. The discovery itself was two-fold, that the blood throughout the living body circulated from the heart through the arteries and back to the heart again through the veins, and that this movement was propelled by the contraction of the heart. The establishment of these two simple facts ended notions, theories, and doctrines which had endured for 1500 years.

Galen and Harvey

Claudius Galen of Pergamum (A.D. 130–201), the greatest physician and the only experimental physiologist of the Roman world, and medical attendant of the emperor, Marcus Aurelius, had left, stereotyped in his authoritative writings, the current views of the blood system. He demonstrated that the arteries contained blood and not air, he held that there were in the blood two tides, a general one and a pulmonary one, or rather that the body was irrigated by two kinds of blood serving a double purpose, one in the veins and one in the arteries. Both contained spirits, a "natural spirit" derived from the liver, an "animal spirit" from the brain, and a pneuma or "vital spirit" from the lungs, though the spirits in the two bloods were not identical. Galen declared also that there was communication through the apparently solid septum between the right and left ventricles, so that there was a partial percolation of the blood between the ventricles. He also claimed that the heart was a bellows, a suction and mixing tank in which the blood was both collected and heated, that the liver was the source and centre of the blood stream, that the veins had no valves, and that the blood system included pulmonary circulation. Now, with the exception of the teaching on the valves in the veins, this was the generally accepted belief before Harvey's time. It was not merely incorrect, but it stood in the way of any sound conceptions of physiology as a whole. Harvey's observations and experiments led him, first, definitely to exclude belief in various "spirits" in the blood, of which there was no evidence; secondly, he found no perforation of the interventricular septum and therefore no passage of blood could take place through it; thirdly, he had learned from Fabricius that the veins had valves, but he observed that they were so placed as to assist the blood in its return to the heart; fourthly, following Aristotle, he found the heart was a muscular pump propelling the blood to the tissues, the right ventricle to the lung and the left ventricle to the rest of the body, "and this is the sole and only end of the motion and contraction of the heart;" and lastly, he demonstrated that the whole mass of blood passed rapidly through the heart, the lungs, and the whole body. This was Harvey's demonstration of the mechanism of the circulation of the blood—pregnant with vast consequences, loaded with fate, something more than an interpretation of the special function of the heart and blood-vessels, more than the explanation of a mechanical act. For, in the first place, he arrived at his conclusion not from books nor logical deduction from facts, but by direct observation and experiment. In his little book, one of the most wonderful little books in the history of man, he sets out, step by step, the mechanical course of events in the cardiac cycle, illustrated by his own convincing tests and experiments. Thus he applied the scientific methods of Aristotle and Roger Bacon as the means of discovering the secrets of Nature. As a Vesalian anatomist he studied the anatomical morphology of the blood system in both man and animals; as a Galenic disciple he conceived of the function of the structures he found, and devised experiments, by vivisection or otherwise, for proving the validity of his interpretations; and he was one of the first to use physical measurement in biological inquiry. And, in the second place, he was never in any doubt that an understanding of the circulation provided the only basis for the intelligent study of the function of the blood itself and of the physical nature of man, of which he claimed the heart as sovereign. So long as the blood contained demons and spirits, was dual in character, and was static or tidal, and so long as the heart was a mixing tank and heat generator rather than the propeller of a circulating fluid, there could be no new physiology. Thus, whilst he neither foresaw nor formulated the subsequent research in physiological problems, he led men to expect an abundant harvest from his seed-sowing. How abundant and how varied will become evident to the reader between the lines of his famous book—see, for example, chapters VIII., IX., and XVI.

Harvey was heavily handicapped by ancient tradition. As Sir Michael Foster said, while Harvey was destroying Galen's doctrines he was wearing Galen's clothes and speaking with Galen's voice. He was also restricted by current knowledge, and could not, for lack of data, explain the ultimate intention of the design which he revealed, a restriction which still governs all scientific deduction. Nor could he complete his work, any more than any other explorer, for it was not a summary of existing knowledge from previous records, but an experimental stage in the development of a high argument. Harvey was a naturalist, like Newton or Darwin; his guiding star was Aristotle and his problem was to discover the nature of man by elucidating the properties and functions of the organs and tissues of the body; and, like all other discoverers, he entered into other men's labours, as his followers entered into his own.

The New Physiology: its Promise for Prevention

Here, therefore, was the opening of a new epoch. In 1622, six years after Harvey's first Lumleian discourse, and six before his book was published,

* The Harveian Oration delivered before the Royal College of Physicians of London on Oct. 18th.

came the demonstration of the lacteals and lymphatic system by which nutriment reached the blood (Aselli, Pecquet, and Rudbeck), an advance strangely criticised, and even unaccepted, by Harvey. In 1648 began the exploration of the chemistry of digestion and the blood (Van Helmont). Ten years later, and one year after Harvey's death, there came (with the microscope) the discovery of the corpuscles of the blood (Swammerdam, Malpighi), and with them the tremendous fact of its nutritive power, and shortly after, in 1661, Malpighi similarly revealed the fine capillaries in the tissues, believed in by Leonardo da Vinci and Harvey himself, but in the absence of the microscope not seen by them. All the deeper problems of physiology, as we now know, turn on the nourishment of the tissues themselves; the blood feeds them and acts on them, and they react on the blood. In 1662 came the first fruits of the mechanics of physiology (Descartes, Borelli), two generations after Galileo's initiation at Pisa and Padua; in 1669 new light was thrown, and thrown forward for a hundred years, on the physiology of respiration, on the purpose and process of the aeration of the blood in the lung, on its selective use of the oxygen of the air, on its carriage to the tissues by the blood, and on the resultant vitality and functioning of those tissues. The work of that bright school of young English physiologists, Boyle, Hooke, Mayow, and Richard Lower our own Fellow, worthy children of the great Harvey, was to be followed in the succeeding century by the actual separation of the gases which control life, carbonic acid, nitrogen, oxygen, and hydrogen. In the eighteenth century also there came the beginnings of the new knowledge of the nervous system and of digestion. In the middle of the nineteenth century Berthold opened a vast new field of research into the secretions of the ductless glands, and later Bernard, Addison, and Brown-Séquard established the foundations of endocrinology. The progress of physiology in England in recent times has been pre-eminent in quantity, quality, and scope, even in a time of universal scientific advancement.

From these illustrations of the kind of discovery that was going forward, I turn to mention some of their applications in preventive medicine. The organised attempt to prevent disease began in England in the fourteenth century when the nation was faced with the disaster of the Black Death, which reduced the population from four millions to two millions in a single year. From that dark day to the present there has been steady, and in recent years, rapid advance. From the sixteenth century the State itself took a hand in the business, and in our own time has secured the coöperation of the private practitioner, the research investigator, and the public medical officer. Their joint achievements have distinguished the last hundred years beyond other secular periods. I suppose that in no previous epoch in the history of mankind has there been such growth of the conception of preventive medicine and the practice of its art. It has saved millions of lives from premature death or crippling disease; it has extended the expectation of life for every infant born; it has, in Rudyard Kipling's phrase, "smote for us a pathway to the ends of all the earth," peopling whole tracts of the world which have formerly been decimated or deserted. In doing these things it has become a primary factor in the destiny of nations and in the future of man's life. It is difficult to make a selection of illustrations, from what Dryden would have called "God's plenty," to prove this growth of knowledge or its applications, because of their manifold and varied character. But I will offer for your consideration three examples, and each of them shall be a descendant of the achievement of the immortal Harvey.

(1) THE PHYSIOLOGICAL BALANCE AS CONSERVATION OF HEALTH

Claude Bernard devoted his life to physiological research in Paris and obtained a world-wide reputation for four discoveries between 1843 and 1853—namely, the glycogenic function of the liver, the action upon digestion of the pancreatic juice, the nerve control of the walls of the arteries, and the displacement of the oxygen in the blood corpuscle in carbon monoxide poisoning. He died among his vineyards in 1878. No one can consider the formidable and varied advances of modern physiology without wondering whether it is possible to weave them into a synthetic "grand purpose," as Borelli foresaw it. Apart from his specific discoveries this is what Bernard did, and it was perhaps his greatest service to physiology. "Animals have really two environments," he said, "an external environment in which the organism is situated, and an internal environment in which the tissue elements live. . . . All the vital mechanisms of the body, varied as they are, have only one object, that of preserving constant the conditions of life in the internal environment."

This is the synthetic principle of Bernard, that all the vital functions of the body establish jointly a constant and stable internal environment for the organism which lives its life amid a variable external environment. He was led to his conclusion by the constancy of the proportion of sugar in the blood as regulated by the liver, but in the last half century we have learned of the relative constancy of the alkalinity and content of the blood (even in transfusion), of the process of respiration, of body temperature, of the nervous integration and regulation of the body, and of the control of the body by the circulation in the blood of the endocrine secretions. Wherever we turn we find evidences of this internal constancy, maintained by respiration, circulation, the course of digestion and nutrition, the activities of the liver and kidney, the secretions of the ductless glands, and the total metabolism of the normal body. We must be reserved in attempting to assess the findings of physiology, to say what is great and what is small, but we shall be safe in accepting provisionally this supreme synthetic interpretation as among its highest gifts.

The further Claude Bernard reflected upon his deduction the more convinced he became both of its validity and its practical application. He says in 1865: "Physiologists and physicians gain mastery over the phenomena of life by learning which conditions in the inner environment are normal and which are abnormal. . . . It is in the study of these inner organic conditions that direct and true explanations are to be found for the phenomena of the life, health, sickness, and death of the organism." He saw indeed in his day that health and capacity depend upon this physiological balance of the constant internal environment surviving and moving in a variable external environment. He wanted men to understand it, to regard it, and to live by it. We now see in our day that the mastery is being attained, in rationale and in practice. In a word, we are beginning to apprehend the physiological life as the basis of health and as the foundation of preventive medicine. Claude Bernard, like Harvey and Hippocrates before him, saw that

the physiological life, Nature herself, is the healer of disease and the protection against its invasion.

This conception was first put into practice in the fifth century B.C. in the Aesculapian temples, the sanatoria of the ancient world; it was carried forward by the gymnastics of the Greeks, by the hygienic vision and education of Hellenism, by the substitution of natural ætiology for the supernatural dæmonic magic and medicine of the East; it inspired the sanitation of the Roman Empire, and there, and in the writings of Celsus, Pliny, and Cicero, it lay embalmed for centuries. The conservation of health in physiological balance revived in the Renaissance and was carried from Florence to Padua, and thus to Leyden and England. We may find it in the letters of Erasmus, in More's "Utopia," in Linacre's translation of Galen's "Preservation of Health," scattered through Shakespeare's plays, in the writings of Sir Thomas Browne and Lord Bacon, in Sydenham's letters, in the great work on Hygiene of Peter Frank the Bavarian—everywhere for the rich and scholarly. Yet it still had to be given to the great mass of the people.

Its proof was sealed by Bachstrom, Lind, and Sir Gilbert Blane in their defence of the health and dietary of seamen; by William Cadogan of this College, who learned it in Leyden and was the first of our Fellows to apply it to mothers and children; by Sir John Pringle, who also found it in Boerhaave's classroom and decided to devote his life to its science, with the result that he reformed the health of the army, and laid a foundation of personal and public hygiene broader and deeper than any previous Fellow of the College. In our own day we have been the witnesses of the labours of a group of physiologists, some of them Fellows of the College, who have abundantly proved the validity of the constant internal environment by the new light which they have thrown upon the internal secretions, chemical and nervous regulation, and the nutrition of the body of man. They established not only our knowledge as to the basis of the conservation of health, but also the application of that knowledge to the direct prevention of disease. We now know that physical health and mental capacity depend upon a mutual contribution of nutrition, hormones, nervous regulation, and oxygenation of the circulating blood, as we also know how these factors can be made direct instruments of the prevention of disease, and thus fulfil the office of medicine, "to tune this curious harp of man's body and reduce it to harmony."

(2) THE CAUSE AND CONTROL OF INFECTIVE DISEASE

Harvey held that the circulating blood carried infection. No group of men followed more faithfully the teaching of Harvey and Sydenham than the physicians of the eighteenth century. By that time the circulation of the blood was fully accepted, and Harvey's mode of workmanship had become part of English tradition, and particularly the standard of this College. Glisson, Regius professor of physic at Cambridge when Harvey was travelling in Europe, was incited by Harvey's example in thorough investigation, and his work on rickets brought together for the first time in England the anatomical and clinical characters of a disease. One of his contemporaries, who also became President of the College, was Sir Edward Greaves, who published in 1643 the first English description of epidemic typhus fever as he saw it in the King's Army at Oxford. Sydenham attempted to arrive at general laws as to the prevalence and course of epidemic disease. Here are three types of investigator who set agoing the annalists of the eighteenth century; they explored the circumstances and clinical features of infective disease, and observed their relation to external environment, to seasons, and to meteorological conditions. Further, Huxham investigated typhoid, typhus, Devonshire colic, scurvy, and diphtheria; Heberden, chicken-pox, measles, epidemic colds, and diphtheria; Fothergill, epidemic sore-throat; Haygarth, small-pox and typhus; Pringle, gaol fever, dysentery, and influenza; Sir George Baker, Devonshire colic and scurvy; Edward Jenner, small-pox and cow-pox; and Willan, skin diseases in London. The seventeenth and eighteenth centuries were, as Charles Creighton demonstrated to us, a new era of epidemics, which became more obvious after the disappearance of the plague. Much was conceived tentatively by way of prevention, and there was a remarkable output of clinical observation, as necessary to-day as then, particularly in differential diagnosis, the effects of treatment, and prognosis. What was lacking was any exact knowledge of causation. In spite of that, the practical sense of the English did, in fact, achieve before the end of the eighteenth century, two significant conquests in this long list of diseases—namely, the control of scurvy and of small-pox.

The mighty movement which changed the whole situation was the advance of bacteriology. It began with surmises and conjectures in the sixteenth century. Fracastor in 1546; Borelli a hundred years later; in 1676 Leeuwenhoek, of Delft, who saw living bacteria by the use of a lens made by himself, provided surmises and conjectures, but it was a long time before the relationship of these living "animalcula" came to be associated with disease. In 1835 Agostino Bassi found the muscardine of silk-worms to be caused by germs, and so became the founder of the germ theory; Pasteur, by his study of fermentation and viruses, and Koch by his ingenious technical methods of isolation proved the case. Only as we view at a distance their labours in the last half of the nineteenth century are we able to appreciate the revolution in the science and art of medicine which they achieved. If we reflect on the fact that in the brief period of 15 years (from 1880–1895) there was discovered the bacterial cause of nine diseases: typhoid fever, tuberculosis, suppuration, glanders, cholera, diphtheria, tetanus, Malta fever, and plague; and that in the same period there was provided the initial form of protective inoculation against anthrax, rabies, diphtheria, tetanus, cholera, and typhoid, we shall understand the magnitude of the modern conquests of preventive medicine.

Much had to be done, much still remains to be perfected, but here we are in an altogether new kingdom, the control by the body of infective processes. But the discovery of the cause of disease lies at present largely beyond statistical calculation, for which indeed the data are often unavailable. It is a story of laboratory exploration, but it exerted an effect outside the laboratory. For the discovery of causal pathogenic organisms immediately led to finding them in the tissues of the affected person. In typhoid, tuberculosis of the lung, diphtheria, tetanus, and plague there arose forthwith the need for a bacteriological diagnosis as well as a clinical. The physician called in the bacteriologist, and the relation of bacteriology to clinical diagnosis became a subject of lively discussion. It stimulated inquiry into possibilities of destroying the bacilli before they entered the body, into the channels of infection

and their control, into inoculation and vaccination, and into antitoxin treatment. Lister's application of antiseptic principles exerted no doubt a highly beneficial effect upon surgery, but its influence was much wider, for it demonstrated a means of control of almost universal application.

Only a generation has passed since the bacterial cause of disease has been our possession. Yet there has been time to assimilate the new knowledge and correlate it with the old, to recognise that in the production and determination of disease the seed is one factor and the soil another. The study of the interaction between them has been illuminating and profoundly instructive. It has confirmed and even fortified the Hippocratic and Harveian confidence in the nature of man's body. Though we cannot as yet assess the degree of control with which this new knowledge empowers mankind, we are not without encouragement provided by a decline in the incidence and mortality of disease, proof of which is supplied by the latest returns of the Registrar-General, though we must beware of deducing from these returns that certain remarkable declines in annual mortality are wholly the result of human action.

(3) IMMUNITY

A third example is artificial immunity, an acquired defence of the host against harmful influences of bacterial origin, perhaps the greatest single advance in modern preventive medicine. It was known before Sydenham's day that an attack of measles or small-pox naturally protected the patient from further attack, and Harvey knew that the blood had protective qualities. But it is only in our own times that explanation of this property has been attempted and found. Pasteur used to say that he received part of his inspiration from Jenner and his empirical experiments in vaccination. Pasteur's chicken-cholera vaccine was in fact comparable to variolation, the inoculation of an attenuated variola. This was the first step in the new movement. In 1880–81 Lister demonstrated the bactericidal property of ox-blood. He showed that it had no inherent tendency to "putrefaction," and that, different from milk, it could indeed withstand "seeding" with tap water and even dust, without apparent decomposition. "These two great truths," he declared, "have been taught us by advancing science: that normal serum is not a good soil for the development of attenuated microbes, and that bacteria introduced among the tissues, if in not too concentrated a form, are disposed of by phagocytosis." Metchnikoff had already described the phagocyte.

Here we have the four facts which formed the basis of the organised exploration which began in our own time—the natural protection provided by an attack of measles or small-pox, the attenuated virus of Jenner and Pasteur, the bactericidal defences of the blood itself, and the phagocytosis of Metchnikoff. Recent study has shown that phagocytosis is more of a physico-chemical effect of various polynuclear cells than, as Metchnikoff assumed, a specific "voracious" faculty of certain particular leucocytes only. It has also shown that the bactericidal property of the circulating blood finds expression in antibodies and opsonins of various kinds, the degree of resistance set up being favoured by its constant internal environment, by its normal antibody content, stimulated by antigens, and by the presence of antitoxins. Such resistance is reduced by any lack of balance due to defective nutrition, to intercurrent disease, or to the susceptibility of the individual.

We now have at command protective inoculation against a number of diseases—e.g., small-pox, anthrax, plague, cholera, typhoid, rabies, and diphtheria, by attenuated virus in small-pox and rabies, and by the dead bacillus as immunising agent in the other conditions. In all these cases the antibodies in the blood do not act alone in antagonising the toxic invasion, they are aided by accompanying cellular changes in the body itself. In the development of acquired immunity we see, in fact, an intensification of the defensive actions and properties possessed by the body in its natural state, which continue after the antibodies have disappeared from the blood. It is common knowledge that the principles of active immunity have now been directly applied, as a result of the work of Sir Almroth Wright, in the treatment of already existing infective disease in the form of autogenous strains of the infecting organism, disintegrated or killed. These act by aiding the local defences of the tissues or stimulating the production of antibodies in the blood. Such autogenous vaccines have been extensively used in the treatment of such conditions as acne, boils, tuberculosis, and streptococcal, coli and gonococcal infections. The discovery, first, that bacteria invading the body produced general effects by secreting a toxin which might pass into the system, and secondly, that the presence of such a toxin stimulated in the normal body cells the production of antitoxins and other antibodies which antagonise or destroy the obnoxious toxin, is one of the most arresting and remarkable of all the revelations which the new knowledge has brought us. It is indeed a confirmation and fulfilment of the Hippocratic doctrine that health and disease are both in themselves "divine," and the body is itself the healer of disease.

Thus the physician is now active in the preventive aspect of healing; his drugs and remedies are not only prescribed for their preventive propensity, but they are specifically preventive in purpose. He not only appreciates the ramifications of infection, but he is vigilant to learn of the channel or vehicle by which his patient has been infected. He takes the new knowledge of immunology and bends it to prevention—he has become an immunisator. He builds up the natural immunity of the body by increasing the powers of resistance of the internal environment by recommending a physiological regimen, and he supplies by artifice an acquired immunity. We are the witnesses of a new approach to disease, a new birth of medicine, *a treatment which is preventive*, undreamed of by Harvey and unavailable in this College two generations ago. We all know the results, some of them dramatic and historic throughout the world, some of them local, prosaic, and obscure, but on the whole profoundly beneficial in the reduction of the incidence and mortality of infective processes.

The Preventive Work of the College of Physicians

Before the days of the existence of the medical department of the Privy Council in 1858 the College was consulted frequently in regard to the practice of preventive medicine and the administration of public health measures by the City of London, the Privy Council, and Parliament. Its internal and designed polity in respect of the Pharmacopœia, the registration of the causes of death, implying the nomenclature of disease, the prevention of plague and small-pox, and the control of alcoholism, has necessarily led it to take an historic share in preventive medicine.

(I.) THE PHARMACOPŒIA

In the Letters Patent constituting the College in 1518 there was included a provision consigning to four persons named by the College the duty of "the correction and government of physic and its professors (practitioners) together with the examination of all medicines and the power of punishing offenders by fine and imprisonment." This duty, confirmed by statute in 1522, was discharged by the College for 340 years, until 1858. In 1540 the College was empowered by statute to destroy any defective drugs, and its authorised visitors were the forerunners of the inspectors and analysts under the Sale of Food and Drugs Act of 1875 and succeeding legislation. In 1585 the College found it necessary to fortify the censors, and guide all others concerned, by publishing a uniform Pharmacopœia, the drafting of which was assigned to a committee of six Fellows. Circumstances occurred to delay their labours, and the matter remained in abeyance until 1614, when a new committee of eight Fellows was appointed, including Harvey himself, and in four year's time they produced the first Pharmacopœia, Sir Theodore Mayerne writing the dedication. It comprised 1028 different articles, "some of them of extraordinary and even revolting character," and 200 of the preparations contained from 10 to 50 ingredients each. Subsequently nine editions were published from 1650 to 1851. The Medical Act of 1858 transferred the duty from the College to the General Medical Council.

For the first 170 years these Pharmacopœias followed the traditional custom derived from the Arabians, being an inventory of drugs used and approved for the time being. But the editions became both more scientific and more directional in 1788 and 1836. The chemical learning of the day was steadily introduced into the Pharmacopœia under the labours and erudition of George Baker, George Fordyce, Tuthill, Ayrton Paris, and Clement Hue. The last two held strong views on the uses of materia medica. In 1819 Paris was appointed to a special lectureship in pharmacopœia at the College, and delivered his revolutionary doctrines on "The Philosophy of the Materia Medica"—an epoch in the history of the science and art of prescribing, as Munk has said. The Pharmacopœia of 1836 was marked by the admission to its pages for the first time of the alkaloids, aconite, quinine, morphia, strychnine, hydrocyanic and phosphoric acids, iodine and bromine preparations, creosote, ergot, and lobelia. Thus was introduced into practical pharmacology in England that new philosophy of the art of therapeutics which is designed to control the internal forces which affect the body or its organs injuriously by means of counteraction, neutralisation, or prophylaxis.

Since the General Medical Council took over from the College, under statute, the duty of authorising a Pharmacopœia they have produced six British Pharmacopœias from 1864 to 1932. If the latest and current edition be compared with the Pharmacopœia of 1836 it will be observed that inter alia it is characterised by two new features. There has been a substantial increase in the number of authorised prophylactic drugs, such as cod-liver oil, liver extract, salvarsan, sanocrysin, atropine, and glucose; and it contains for the first time a new category of biological agents of a directly preventive nature, the use of which has greatly strengthened what the compilers of the reformed Pharmacopœia of 1836 called "the armamentarium of the physician," particularly in respect of artificial immunity. For among these biological substances are the vaccines, antitoxins, and antibacterial sera, thyroid and parathyroid extract, insulin, adrenalin, and pituitrin, now standardised under the Therapeutic Substances Act of 1925.

(II.) REGISTRATION OF CAUSE OF DEATH AND NOMENCLATURE OF DISEASE

The year before Queen Victoria came to the throne Parliament passed an Act for the registration of births and deaths, a natural corollary to the census of 1801. Births and deaths had been partially registered in the parish records of England since the days of Queen Elizabeth. But many of these church registers having been lost, the Act of 1836 was passed to make the record secular and complete, independent of religious opinion. Thus did the legislature of England, in the words of Dr. William Farr, "take the lead in advancing the health of Europe."

But it was not the Act of 1836 which secured this, for it alone was insufficient. In the spring of 1837 the Registrar-General wrote to the College of Physicians soliciting the aid of "every practising member of any branch of the medical profession" in sending to the local registrar of deaths "a written statement of the *cause* of death" of any person upon whom he was in attendance. On May 1st Sir Henry Halford, the President, jointly with the President of the College of Surgeons (Sir Astley Cooper) and the Master of the Apothecaries (Dr. Hingeston), issued their memorable circular to the profession asking all practising medical men to enter on the death certificate the authentic cause of death. They claimed that the important object of such returns, when collated, would be more accurate knowledge (1) of the comparative prevalence of various mortal diseases in England and Wales; (2) the localities where they prevailed; and (3) the age, sex, and condition of life principally affected. Here, then, was a statistical method which, as Farr pointed out in his report to the Registrar-General in 1839, gave the State for the first time the necessary foundation for modern nosology and epidemiology, for treatment and for prevention. For the voluntary practice thus initiated by the College (fulfilling, as it happens, an intention declared by the College in the sixteenth century) the Registrar-General officially and publicly thanked the medical profession, and after a generation of experience Parliament, in 1874, made statutory provision requiring the *medical certification of the cause of death* in all cases. It is this registration of the *cause* of death by the medical practitioner which lies at the back of the application and direction to-day of public health measures for communal health.

When at the Registrar-General's request, Farr undertook the task of classifying the causes of death returned by the medical profession in 1837, he was faced with the immediate necessity of an appropriate Nosology, using at first that of Cullen. Subsequently he tried the "Physiological System of Nosology" of 1820 by Dr. Mason Good, dedicated by permission to the College of Physicians, of which he was a distinguished and scholarly licentiate. In 1840 Farr adopted a classification of his own design, "the English classification," revised after the international statistical congress at Brussels in 1856. In the following year a letter was addressed to the College of Physicians by the Epidemiological Society, representing the medical advisers of the Army, the Navy, the Registrar-General, and the East India Company, asking the College to "take charge of

drawing up a Nomenclature of Diseases for use in the military services and in civil life." In response the College appointed a committee on July 9th, 1857, of which Dr. Francis Sibson, friend and pupil of Thomas Hodgkin, was secretary. Its meetings were suspended temporarily in 1858, but by 1869 the new nomenclature of diseases was ready, and on March 6th Her Majesty's Treasury approved of its gratuitous distribution among 20,000 registered practitioners in the United Kingdom. Sir Thomas Watson was chairman of the committee and Dr. Farr was the principal adviser. Statistical data and uniformity of nomenclature are great things, but accurate diagnosis and the correct certification of the cause of death are greater. For this is the first and most fundamental factor in any scientific form of control. It was largely because of this public-spirited contribution by the College of Physicians that the Registrar-General's reports became the basis of the application of preventive medicine in England and in civilised States throughout the world.

(III.) THE PLAGUE

The contribution of the College to preventive medicine was, however, even more direct than its polity. The plague was prevalent in England from 1348–1666. From the experience of Wolsey and letters from Erasmus and Sir Thomas More, we know that when the College was founded by Henry VIII. there was prevalent in London the third outbreak of the sweat and the plague (which prevented the king from coming to London). In 1518 the King himself, on the advice of his physicians, had recommended the marking of plague-infected houses and preparatory arrangements for quarantine, a recommendation which became the first plague order in 1543. In 1529 the King urgently consulted his College of Physicians as to what means they advised for the prevention of this disease. The Privy Council in 1532 also on their advice ordered the issue of plague-bills, the first of a long series which were succeeded by the registration of plague deaths in parishes (1539). In 1563 the College was satisfied that there was some relation between animals and human plague, and recommended the destruction of dogs and cats. Under the more vigorous preventive policy of Elizabeth the Privy Council instructed the Lord Mayor of London to close infected houses, consider the necessity of establishing an isolation hospital, and appoint special medical officers to deal with the disease. The Lord Mayor consulted the College as to the number and personnel of these officers.

From 1630 to 1665 the College of Physicians issued advices periodically as to the prevention of plague. It is true that many of their recommendations were derived from former practices of somewhat mediaeval character, such as the sovereign remedy of flight, the marking of infected houses and persons, the appointment of "searchers," strong-smelling fumigations, and the necessity of sanitary cleanliness. The control of animals and tainted food, the removal of "annoyances," and the speedy burial of the dead emerged from current belief that they served as sources of infection. The medical profession were by no means unanimous as to the best course to take, and Fellows of the College were not always, then as now, in complete agreement with one another. They were roundly abused by Dekker, the dramatist. Yet we have from Licentiates or Fellows of the College the best records of current medical knowledge of plague. Thomas Lodge first studied arts at Oxford and law at Lincoln's Inn. He was a poet and dramatist, and from his *Euphues Golden Legacie*, Shakespeare constructed his *As You Like It*. Subsequently he studied medicine at Avignon and in 1603 he wrote a treatise on the plague, of which he died in 1625. Like Skene, 30 years before, he notes that a prevalence of plague is indicated by rats forsaking their holes. He advocates as preventive measures the removal of shambles from the city, sanitation, ascertainment of plague cases, the disinfection of bedding and clothes, and the discreet but compulsory removal of patients to isolation hospitals to be publicly provided.

Sir Theodore Mayerne advised the King as to prevention of the plague in 1631, and Wharton, Witherley, and Hodges, also Fellows of the College, remained in London during the plague of 1665 and were active in the prevention of its spread. Richard Mead did not live in the time of the plague, but owing to public alarm as to possible invasion in 1720 he was, whilst censor of the College, commissioned by the lords of the Regency to advise the Government, and in his Discourse on the Plague he summarised the medical knowledge of his age.

He recommended the appointment of a Council of Health to ascertain and register the cases and provide for their isolation, and for the destruction of infected goods, and the disinfection of bedding and clothing. The suppression of vagrancy and the institution of sanitary cordons round infected districts and quarantine, also among the recommendations, have proved the ancestors of modern methods.

(IV.) EXCESSIVE SPIRIT DRINKING

In 1725, under the presidency of Sir Hans Sloane, a representation from the College upon the evils produced by the excessive drinking of spirits resulted in the passing of the Gin Acts, the suppression of gin-shops, and the restriction of private retail sales. In face of a similar social problem, 190 years later, a group of Fellows of the College were consulted as to the appointment and work of the Liquor Control Board (1915–1918). The effect of that Board in securing a sober people is well known to us all.

(V.) SMALL-POX AND VACCINATION

Inoculation of diminutive doses of small-pox serum for the prevention of natural small-pox was introduced into England by Timoni, a Greek of Constantinople, in 1713, and was practised tentatively, and then fell into abeyance by 1740. It was reintroduced by Kilpatrick of South Carolina, and Frewen, a pupil of Boerhaave in 1743. In 1754, when small-pox was a scourge in England, the College of Physicians in a formal minute pronounced inoculation to be "highly salutary to the human race." In 1755 Dr. Robert Taylor delivered the Harveian Oration, remarkable for its vigorous promulgation of the practice of inoculation. Forty-three years later (1798) Jenner announced his method of vaccination with the serum of cow-pox as a means of protecting the human constitution from the infection of small-pox. This was substituted for the method of small-pox inoculation. Jenner also began forthwith the organisation of communal vaccination. Four years afterwards (1802) the House of Commons resolved, on the advice of the Prime Minister (Mr. Addington) that on Jenner's petition (March 22nd, 1802) it would call for a report from a committee of the House on the validity of vaccination. Subsequently Parliament preyed the King to "direct His Royal College of Physicians to inquire into the state of the vaccine inoculation in the United Kingdom, and to report

their opinion as to the progress which it has made, and the causes which have retarded its general adoption." The College replied in 1807, and their memorable answer, which was the beginning of their leadership in small-pox prevention, closed with the following words:—

"From the whole of the above considerations, the College of Physicians feel it their duty strongly to recommend the practice of vaccination. They have been led to this conclusion by no preconceived opinion, but by the most unbiased judgment, formed from an irresistible weight of evidence which had been laid before them. For, when the number, the respectability, the disinterestedness, and the extensive experience of its advocates is compared with the feeble and imperfect testimonies of its few opposers; and when it is considered that many, who were once adverse to vaccination, have been convinced by further trials, and are now to be ranked among its warmest supporters, the truth seems to be established as firmly as the nature of such a question admits; so that the College of Physicians conceive that the public may reasonably look forward with some degree of hope to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages at least, if not to the existence, of the small-pox."

Following on this declaration signed by Sir Lucas Pepys, president of the College, there was a debate in the House of Commons on June 9th, 1808, in which Mr. Rose secured the assent of the House to a resolution, "that public benefit would be derived from the establishment of a central institution in London for the purpose of rendering vaccinia inoculation generally beneficial to His Majesty's subjects." On this resolution the Privy Council called upon the College of Physicians to appoint a medical board to inquire into the methods of vaccination generally used, with their success or failure, and to organise and set in action a central institution for carrying on in London, under their own immediate superintendence, the practice of vaccination, and for distributing vaccine lymph to every part of the Empire. In 1858 Mr. John Simon, the medical officer of the Privy Council, was associated with the board; it made its last report to the Privy Council in 1860, and in the following year, on the death of the registrar, Dr. Clement Hue, the Privy Council itself took "the affairs of the Establishment under their own immediate direction."

Thus for more than fifty years the College of Physicians became the pronounced advocate of vaccination, undertook to initiate the control of the national movement for vaccination, inquired into its results, supervised its working, and standardised and distributed the lymph. Subsequently, these duties were undertaken by the Privy Council from 1861 to 1871, by the Local Government Board from 1871 to 1919, and since that date by the Ministry of Health.

Closely allied to this remarkable service of the College was their action a generation later in respect of antitoxin for diphtheria. In 1886 a deed of arrangement was drawn up between the Royal College of Physicians and the Royal College of Surgeons for the establishment of a conjoint board for the purpose of conducting their joint examinations or "for any other purposes of the Colleges as they may from time to time jointly agree." One of these other purposes was the establishment of laboratories for investigational work. In 1890 Dr. (afterwards Sir) Sims Woodhead was appointed as director, and in 1894 he and his colleagues, with the generous financial assistance of the Goldsmiths Company, began their work in the standardisation, preparation, testing and distribution to London hospitals of antitoxin for diphtheria. This voluntary task of the College proved invaluable in promoting the usage of this therapeutic and prophylactic means, hardly less effective in result, though proportionately less in degree, than the establishment of vaccination for small-pox. In 1890 the conjoint board of the two Colleges rendered powerful aid to the administrative and educational aspects of communal preventive medicine by creating a special diploma in public health (under the Medical Act, 1886), followed subsequently by a comparable diploma in tropical medicine and hygiene

Communal Medicine and Individual Practice

Throughout its history the College of Physicians has been the foster-mother of sound medical practice, and in each of its four centuries has nurtured and cultivated the Renaissance spirit of true learning and inquiry. When Linacre met Hermolaus Barbarus in the Vatican library he contracted a friendship which influenced his life, and in Florence, Rome, and Padua he drank at a more living source than he had found in Oxford. Its dynamic effect not only revived the spirit of the Oxford Reformers, but had much to do with the foundation of this College and the introduction of Greek medicine in England. From its earliest years it has had many Fellows or Licentiates who have contributed to the advancement of the science and art of medicine, and not a few who have moved forward our knowledge in physiology and pathology and their applications to preventive medicine. Among them should be especially commemorated the group of men, such as Harvey, Chamberlen, Manningham, Smellie, and William Hunter, who prepared the way in obstetrics for the prevention of puerperal fever; Lodge, Hodges, Wharton, and Mead, who established the defences against plague; Sydenham, Greaves, Heberden, Fothergill, Murchison, Willan, and Watson, who differentiated the epidemic fevers and laid the basis for their control; a long line from Harvey to the present day, who opened the doors of physiology; and George Baker, John Pringle, Southwood Smith, Edmund Parkes, J. H. Bridges, Patrick Manson, William Leishman, and David Bruce, devoted Fellows of the College, who left behind a splendid harvest of national and international preventive medicine. Named or unnamed these are the workers whom we commemorate to-day, and whose works do follow them. But their works follow them in a new world. The extraordinary advance in the science and art of medicine has supplemented the work of the family physician of a former day by providing an extensive system of general and special hospitals, laboratories, sanatoria, and clinics, with a no less comprehensive system of specialists on the one hand, and public medical services on the other. Yet the family physician will always remain the most economic and effective physician for the vast majority of human ailments. In any event, the registered medical practitioner will be the first into whose hands will fall the recognition and treatment of the beginnings of disease. Moreover, the practice of medicine must always remain both *inductive* and *individualistic*.

There is evidence that the State appointed public doctors at least as early as Democedes (c. 510 B.C.) and the custom was extensively followed throughout the Roman Empire. In England the first obvious intervention by the State was in the sixteenth century on account of the existence of certain foci of disease among the poorest and most vagrant class of the community, neither able nor willing to obtain medical advice and yet contributing to the spread of disease in the community. It

became apparent that the State was the only available authority which could direct the application of advancing medical knowledge and practice to the problem. In the first half of the nineteenth century such action of the State became more formal and statutory, both in providing medical and surgical treatment for the poorest classes and in formulating sanitary measures to protect the whole community against insanitary environment or the spread of infectious disease. This profound and far-reaching development of a communal medical service has proceeded alongside the work of private practice. Since 1834 there has been a poor-law medical service, and out of it a few years later emerged the public health service, which in recent times has incorporated a number of special medical services, including those for maternity and child welfare, for the school-child, and for health insurance, each of which had begun in a voluntary form and grown spontaneously before the State had recognised its validity. No single person and no single movement is responsible for this creation or its development; it has emerged as part of the social evolution of the time in which we happen to live. Speaking generally, however, it is expedient that certain principles should be recognised in any public medical service.

(*a*) The province of the State should be to bring the physician and the patient together under circumstances which will be acceptable to the patient, whilst facilitating and safeguarding the work of the physician.
(*b*) The State should encourage the provision of the necessary hospitals and clinics with proper equipment.
(*c*) No one, not even the State, should come between the physician and his patient, whether in private or in public practice. For the physician (and not the agency, whether voluntary or statutory, which brings his patient) must both diagnose the morbid condition and prescribe effective treatment.
(*d*) The State should exercise supervisory administrative control if the medical service in which the physician is engaged is communal or is paid for, partly or wholly, by rates or taxes.

There is nothing here which in principle departs from the primary and paramount benefit of the patient, or invades the reasonable prerogatives of the physician. Indeed, in the English health insurance system there is free choice of physician and patient; advice, treatment, and prevention within the compass of the knowledge and experience of the private practitioner; and the maintenance of the responsibility of the patient, through his contributions, for the payment of the practitioner. Moreover, the system is such that it imposes a check on excessive claims of patients and on protracted benefit received during incapacity; in administration it is free from political control, for the management is in the hands of the contributor and the physician, as well as statutory bodies and the State; it provides for the education of the people in hygiene by their own physicians; and, lastly, it is so designed as to provide facilities for the initiation of research, and the keeping of fuller clinical records than in the past. Such a system cannot *insure*, or indeed be ultimately effective, any more than private practice can be ultimately effective, unless the principles of preventive action in regard to the processes of disease in the individual are recognised and practised.

It is obvious that numerous problems lie in front of the development of the coöperative association of the private practice of a former time with the public medical services of a new epoch. One thing is clearly necessary and even predominant—namely, mutual coördination between all channels and means of medical activity, in order that the integrity and goodwill of the healing art may be maintained, and that the patient, be he rich or poor, may receive the full advantages of the science and art of medicine which have become available since the days of Harvey's demonstration of the circulation of the blood.

BIOLOGICAL TYPES OF DIPHTHERIA BACILLUS

AND THEIR CLINICAL SIGNIFICANCE

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ATTENTION has recently been drawn by Anderson, Happold, McLeod, and Thomson [1] to the occurrence of different biological varieties of the diphtheria bacillus associated with clinical types of the disease which differ in severity and response to antitoxin treatment. They described two main types having apparently distinct and characteristic colony forms when grown on a special tellurite blood medium. They named these *B. diphtheriæ* "mitis" and *B. diphtheriæ* "gravis," associated respectively with mild cases, and severe cases giving a poor response to antitoxin treatment. They also described the occurrence of "intermediate" types. They claimed that all these types are constant and have definite characters. The gravis and mitis types were characterised as follows:—

Gravis.—Colonies after 48 hours' growth on the special tellurite medium were grey or greyish-black and showed a daisy-head form; the bacilli were short, and when grown on Löffler's serum medium their metachromatic granules were either well marked or scanty; non-hæmolytic; fermented glucose, galactose, maltose, but not saccharose; also fermented dextrine, starch, and glycogen, but not d. glucosamine; broth cultures showed pellicle formation with granular deposit and reversion to an alkaline reaction in two days.

Mitis.—Colonies after 48 hours' growth on the tellurite medium were black; the bacilli when grown on Löffler's serum medium presented the morphological features generally regarded as typical of *B. diphtheriæ*; hæmolytic; fermented glucose, galactose, maltose, but not saccharose; also fermented d. glucosamine, but not starch or glycogen; inconstant results with dextrine; broth cultures showed a uniform turbidity and the acid reaction persisted for 4–5 days.

The *Intermediate* types exhibited some characters of mitis and some of gravis.

These findings, if substantiated, are not only of practical importance and significance in the ætiology and treatment of diphtheria, but might be regarded as almost revolutionary in regard to our knowledge of the bacteriology of the disease.

A study of a series of strains of diphtheria bacilli isolated from different cases in Edinburgh has been carried out following closely the methods used by these workers, and the data correlated with the clinical records of the cases.

METHODS

Unselected "positive" cultures on Löffler's medium were taken from those made for the routine examination of diphtheria cases.

Plates of the special "chocolate" tellurite medium as used by Anderson et al.[1] were inoculated from the primary cultures and examined at the end of 24 and 48 hours; colonies of *B. diphtheriæ* were picked off on Löffler

[1] Anderson, J. S., Happold, F. C., McLeod, J. W., and Thomson, J. G.: Jour. Path. and Bact., 1931, xxxiv., 667.

and agar slopes. The cultures were examined microscopically at the end of 24 hours, and subsequently hæmolytic and fermentation tests were carried out. The growth in broth was observed and the time taken for the original acid reaction to revert to alkaline was determined. Each strain was also tested for virulence.

Simultaneously, but independently, full clinical records of these cases were kept at the City Hospital, the bacteriological and clinical records being compared at the end of the investigation.

The media used throughout were similar to those described by Anderson et al. The tellurite medium was prepared from Witte's peptone and horse blood instead of rabbit blood. When the strains had been isolated, a batch of this medium was made using rabbit blood and peptone (Parke, Davis and Co.), as in the original formula, and the strains replated on this.

Broth cultures.—The broth used at first was "Lab. Lemco" bouillon with 1 per cent. peptone, phenol red being added as indicator; but good growth at a pH suitable for this indicator (7·2) was not obtained. Hydrocele fluid was therefore added, and the strains all tested in this but at varying times after isolation. An initial increase of the original acid reaction was observed to occur within 24 hours of inoculation.

Fermentation tests.—Hiss's serum water was used with 1 per cent. peptone (Parke, Davis and Co.) and the particular carbohydrate added. Phenol red was used as indicator and the pH was 7·2. Difficulty was encountered with saccharose and starch, several kinds of each being tried. Easily fermentable products of hydrolysis were evidently produced by even a minimum of heat sterilisation, and gave equivocal results. Finally starch (British Drug Houses, A.R.) was used, and both the starch and saccharose media were sterilised by filtration only. The finished starch medium produced a brown-purple reaction with iodine. Dextrine and d. glucosamine were not used.

COLONY TYPES

Cultures kindly supplied by Prof. J. W. McLeod, which had been subcultured for several months on agar, yielded cultures (36–48 hours) on the special medium as follows:—

1. *B. diphtheriæ* mitis.—A fairly large, black, smooth, round, flattened colony, with a somewhat nippled centre, steeply sloping sides, and narrow, flattened, entire grey margin.

2. *B. diphtheriæ* gravis.—A greyish-black, smaller, less smooth, domed colony with domed black centre and wide grey, sloping irregular margin, showing some radial striation. No definite "daisy-head" form was observed, but older colonies tended sometimes to show a sunken ring in the centre.

3. The *intermediate* form produced a much smaller colony, greyish-black with domed centre, somewhat irregular margin and some radial striation.

The medium containing rabbit blood and peptone (Parke, Davis and Co.) tended to produce a less smooth type of colony and to show more markings and radial striations.

Among the series of strains isolated from cases in Edinburgh, colony types were observed which were similar to those of the standard cultures described above: type I. corresponding to gravis, type III. corresponding to mitis, and type II. being intermediate. Very considerable difficulty, however, was found in classifying the colonies, as a great number of varying characteristics was encountered.

BROTH CULTURES

The broth cultures also showed great differences, and a gradation from clear fluid with coarse granular growth and deposit, to uniform turbidity with fine granular deposit, and uniform fine granular turbidity. Pellicle and ring formation was found with examples of each kind of growth.

CELL MORPHOLOGY

The cell morphology in Löffler's serum cultures (24 hours) stained by Neisser's method showed great variations from the "text-book" form (long, thin, slightly curved bacilli with definite bipolar granules) to straighter, thicker, less definitely staining organisms of very varying length. Some almost coccoid forms were met with. In these less typical forms the number of granules was very varied, in some strains appearing only in a few individual organisms. These were usually small, and did not protrude beyond the cell body.

The differences and gradations especially in colony formation and growth in broth require to be stressed to show the difficulty found throughout in classifying the different strains with anything approaching accuracy.

STRAINS ISOLATED

Strains which did not ferment glucose, galactose, and maltose, or which fermented saccharose, were

TABLE I

Case No.	Colony type.	Growth in broth. Pellicle.	Growth in broth. Fluid.	Growth in broth. Reversion to alkalinity (days).	H. = Hæmolytic G. = Glycogen fermenter.	Metachromatic granules (Löffler).	Clinical type.
1	I.	+	Clear.	7	—	±	Slight.
2	,,	+	,,	5	—	±	,,
3 *a* T.S.	,,	+	,,	6	—	±	Severe.
b N.S.	,,	+	,,	6	—	+ +	
4	,,	+	,,	5	H.	±	Slight.
5	,,	+	Turbid.	2	—	+ +	Moderate.
6	,,	+	,,	3	H.G.	±	Slight.
7	,,	+	,,	2	H.	+ +	Moderate.
8	,,	–	Clear.	17	—	+ +	Slight.
9	II.	+	Turbid.	3	H.	±	,,
10	,,	–	,,	6	—	±	Moderate.
11	,,	–	Clear.	5	—	±	Slight.
12 *a* T.S.	,,	–	,,	5	—	±	Carrier.
b N.S.	,,	–	,,	6	—	+ +	
13	,,	–	,,	6	—	+ +	Slight.
14	,,	–	,,	5	—	+ +	Moderate.
15	,,	–	,,	11	H.	+ +	,,
16	,,	–	Turbid.	6	—	+ +	Severe.
17	,,	–	,,	5	—	+ +	Moderate.
18	,,	–	,,	6	H.	+ +	,,
19	,,	–	Clear.	10	—	+ +	Slight.
20	,,	–	,,	4	—	+ +	,,
21	,,	–	,,	14	G.	±	,,
22	,,	–	,,	8	—	±	,,
23	,,	–	,,	6	—	±	Moderate.
24	,,	+	,,	8	—	+ +	,,
25 *a* T.S.	,,	–	,,	6	—	±	,,
b N.S.*	,,	+	,,	8	—	+ +	
26	,,	+	,,	6	—	±	Slight.
27	,,	–	Turbid.	7	—	+ +	,,
28	,,	+	Clear.	15	—	±	Carrier.
29	,,	+	,,	2	H.	±	Severe.
30	,,	+	Turbid.	3	—	±	Severe F.
31	III.	–	Clear.	7	H.	+ +	Moderate.
32	,,	–	Turbid.	3	H.	+ +	Carrier.
33	,,	–	,,	6	H.	+ +	Severe F.
34	,,	–	,,	3	H.	+ +	,, F.
35	,,	–	,,	2	H.	+ +	,, F.
36	,,	–	,,	3	H.	+ +	Carrier.
37	,,	–	,,	4	H.	+ +	,,
38	,,	–	,,	3	H.	+ +	,,
39	,,	–	,,	6	H.	+ +	Slight.
40	,,	–	,,	3	H.	+ +	Moderate.
41	,,	–	,,	3	H.	±	,,
42	,,	–	,,	5	—	+ +	,,
43	,,	–	,,	3	—	+ +	,,
44	,,	–	,,	3	—	+ +	Slight.
45	,,	–	,,	3	—	+ +	,,
46	,,	–	,,	3	—	+ +	,,
47	,,	–	,,	2	—	±	Carrier.
48	,,	+	Clear.	3	—	+ +	,,
49	,,	+	,,	2	G.	+ +	,,
50	,,	+	,,	3	H.	+ +	Moderate.

T.S. = Throat swab. N.S. = Nasal swab. F. = Fatal. * = Convalescent. Granules ± and + + = few and well-developed respectively.

TABLE II

Colony type.	I. (9 strains).	II. (24 strains).	III. (20 strains).
Hæmolytic	3	4	12
Broth—pellicle	7	7	3
,, turbid	3	7	16
,, clear	6	15	4
Alkaline in 2–3 days ..	3	3	15
Well-developed metachromatic granules (Löffler)	4	12	18

discarded, except one strain which persistently fermented filtered saccharose, was constantly though weakly virulent, and which had been isolated from a chronic carrier (adult). Organisms which gave "typical" fermentation reactions, but were avirulent and were found to be from so-called carriers which rapidly became negative, or from mild cases of doubtful diagnosis were also discarded. Two, however (type II. and type III. colonies), which were avirulent to guinea-pigs on repeated inoculation are included in the series, having been isolated from definite cases of clinical diphtheria.

A series of 50 cases remains, the main results being set out in Table I. and summarised in Table II.

Three strains only fermented glycogen: (1) type III. colony, (2) type II. colony, (3) type II. colony, taking 14, 4, and 4 days respectively, whereas gravis fermented glycogen in 24 hours. Six strains were not tested. No strains were found which fermented the starch medium used.

OBSERVATIONS ON BACTERIOLOGICAL FINDINGS

It can be said from the foregoing that type III. has a tendency to be hæmolytic, produce turbidity in broth and well-developed metachromatic granules, and that type I. tends to produce a pellicle with clear fluid in broth culture; but anything approaching a hard-and-fast classification cannot be made using these criteria. Indeed, a remarkable number of different types emerge; as many as 31 could be enumerated. Cases 32–40 form the largest group of 9 similar strains; 42–46 (5 strains) another group; 1–3 (*a*) another; 12 (*b*)–14 another, and so on, the other strains being practically all different in some respect. It may be noted here that the strains in the larger groups were isolated from very dissimilar clinical types.

The relative numbers of cases in the three categories (type I., 8; type II., 22; type III., 20) is in striking contrast to the figures given by Anderson and his co-workers (gravis, 63; intermediate, 6; mitis, 35), a much larger proportion falling into the intermediate class.

STABILITY OF STRAINS

In two cases where both nasal and throat swabs were isolated from the same case a difference in morphological appearance was noted, other characteristics being approximately the same. In one case, where virulent organisms were isolated from throat swabs made at the beginning of the disease and during the third week, the colonies were similar, but there were slight differences in the broth cultures, and considerable morphological differences. This indicates either that different strains can be isolated from the same case, or, and more probably, that the strain is not stable. Anderson and his co-workers concluded that one strain only could be isolated from each clinical case, and also that strains isolated remained stable.

To test the stability of growth characters in broth, seven different strains were taken at random and subcultured in series at intervals of three days on the same batch of hydrocele broth (six subcultures each strain). The following results were obtained:—

Strain a (type I. colony).—Clear fluid and fine granular deposit in all cultures; slight pellicle formation in one.

Strains b and c (type II. colony).—Clear fluid and fine granular deposit in all cultures; pellicle and ring formation varied.

Strains d and e (type III. colony).—Various degrees of uniform and fine granular turbidity, with or without ring formation.

Strain f (type II. colony).—(1) Clear fluid, granular deposit and ring. (2) Clear fluid, granular deposit and pellicle. (3) Turbid fluid, granular deposit and ring. (4 and 5) Clear fluid, granular deposit, ring, and slight pellicle. (6) Fine granular turbidity, granular deposit, and ring.

Strain g (type III. colony).—(1) Clear fluid, coarse granular deposit. (2 and 3) Turbid fluid, fine granular deposit. (4) Clear fluid, fine granular deposit. (5 and 6) Uniform turbidity, fine granular deposit, and ring.

The variations which arose in this series of broth cultures indicate fairly clearly that strains of *B. diphtheriæ*, at least when recently isolated, are not stable, and therefore that broth culture can be no sure criterion for any sort of classification.

CORRELATION OF CLINICAL FINDINGS

The cases were classified into groups according to Bie's [1] short classification of faucial diphtheria as follows:—

(*a*) *Cases of slight severity.*—Membrane not fully covering the tonsils, post-nasal catarrh occasionally. Exceptionally, fœtor or slight peri-adenitis.

(*b*) *Cases of moderate severity.*—Membrane covering the tonsils and the palatine arches or the tip of the uvula; post-nasal catarrh; fœtor and slight peri-adenitis frequent; only exceptionally albuminuria and other signs of toxæmia.

(*c*) *Severe cases.*—Membrane covering tonsils, uvula, and soft palate, and frequently the hard palate also, or the posterior pharyngeal wall or buccal mucous membrane; post-nasal catarrh and fœtor; very marked peri-adenitis; albuminuria frequent; signs of toxæmia.

(*d*) *Carriers* ("healthy") who gave no history of having suffered from diphtheria. Fauces and nasal mucosa clean.

Group C includes all toxic, hypertoxic, and tracheobronchial cases. Clinical classification dependent upon anatomical extent of membrane is not satisfactory, and it is practically impossible to attempt to classify degrees of toxæmia. The cases are grouped according to colony type and other main characters in Table III.

TABLE III

Clinical type.	No. of cases.	Hæmolytic.	Glycogen fermenters.	Growth in broth.		Colony type.			Well-developed granules.
				Pellicle.	Clear fluid.	I.	II.	III.	
Carriers ..	10	4	1	3	5	—	3	7	7
Slight severity	18	4	2	6	11	5	9	4	9
Moderately severe	17	7	—	5	8	2	9	6	13
Severe ..	8	4	—	4	3	2	3	3	5
Fatal	4	3	—	1	—	—	1	3	3

OBSERVATIONS ON CLINICAL FINDINGS

The number of cases is admittedly small, but it seems fairly clear from these data that there is nothing approaching an exact correlation between clinical type and biological characteristics of associated strains of diphtheria. There seems to be a tendency for strains isolated from the most severe clinical types to be hæmolytic, and of the three glycogen-fermenting strains one was isolated from a carrier case and two from mild cases. Type III. colonies certainly predominate amongst the carrier cases, but so also amongst the fatal cases; otherwise the numbers are not very conclusive. These findings do not in any way support a classification such as that made by Anderson and his colleagues. Nine of the type III. organisms isolated corresponded in morphology, growth in broth, and hæmolytic power to *B. diphtheriæ* mitis. Clinically, four were carrier cases and three were fatal cases. Similarly, three type I. organisms corresponded to *B. diphtheriæ*

[1] Bie, V.: Deut. med. Woch., 1929, iv., 563.

gravis, though these did not ferment glycogen. Two of the latter were from mild cases, but one was from a highly toxic case in an adolescent.

This case was admitted to hospital on the eighth day of disease with extensive membrane covering most of the fauces and soft palate. There was marked œdema of the throat with copious membranous nasal discharge, fœtor and cervical adenitis causing bull-neck. 50,000 units antidiphtheritic serum (20,000 units intravenously and 30,000 units intramuscularly) were given on admission. Progress was satisfactory. The throat was clear and obvious signs of toxæmia disappeared by the seventh day. On the ninth day after admission there was a moderate degree of myocarditis with dilatation of the left ventricle. Palatal and pharyngeal paralysis developed. The case ultimately made an excellent recovery.

This case, therefore (No. 3, Table I.), would appear to correspond fairly closely to the severe type and its associated gravis strain, except for the absence of glycogen fermentation and the satisfactory response to serum therapy.

SERUM THERAPY

It is the practice in the Edinburgh City Fever Hospital to use Burroughs Wellcome antidiphtheritic serum, and to give doses ranging from 4000 units for a case of slight severity, to 150,000 units for a severe or hypertoxic case. Repeat or further doses are given if necessary within 24 hours. Second doses of antitoxin were required in six cases in the series; from four, type II. organisms were isolated; from two, type III., all except one occurring in children under 10. These all responded to the second dose.

FATAL CASES

One of the fatal cases (No. 33, Table I.) occurred in a woman suffering from severe hyperemesis gravidarum and acute yellow atrophy of the liver. While the throat swab was undoubtedly "positive" and a virulent type III. organism, typical in morphology and fermentative action, was isolated, the case was further complicated by pneumococcal and streptococcal infection, and the ultimate cause of death was probably septic abortion.

The others were all admitted to hospital late in the disease and occurred in children (10 weeks, 10 years, and 5 years), the last having had measles five weeks previously.

SUMMARY AND CONCLUSIONS

1. A series of organisms having the accepted biological characters of *B. diphtheriæ* was isolated from 50 cases of clinical diphtheria. Forty-eight of these were all proved virulent by the animal inoculation test.

2. An attempt was made to classify these according to colony type, growth in broth, hæmolysis, morphology, and fermentation reactions, and to correlate the results with the severity of the clinical types of disease.

3. Whereas organisms with very different characteristics were isolated, no hard-and-fast bacteriological classification or clinical correlation was arrived at according to these criteria. On the contrary, the strains were found to be exceedingly varied.

4. Seven strains were tested for constancy of cultural characteristics in broth, and found to be variable in different degrees.

There seem to be no grounds for any clinical correlation with colony type, nor any suggestion that poor response to serum is associated with any one type of the organism. Possibly the true gravis form does not occur in Edinburgh at present, or that differences in technique account for some discrepancies between the present findings and those of other workers. It seems to be fairly clear, however, that even if there is any broad basis for bacteriological classification according to the criteria used, there are many other factors which must influence the severity of the disease produced, and the patients' response to serum therapy.

Thanks are due to Prof. T. J. Mackie, of Edinburgh University, under whose direction the bacteriological work has been carried out; to Dr. W. T. Benson, medical superintendent of the Edinburgh City Hospital, for permission to use the cases; and to various members of the laboratory staff for their willing coöperation.

HÆMORRHAGIC DISEASE OF THE NEW-BORN

A STUDY OF TWENTY-EIGHT CASES

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IN 1924 I published a paper [3] which recorded 6 cases of hæmorrhagic disease of the new-born baby, and included a brief review of the subject. Since that year I have treated 22 cases of the disease. The whole series of 28 cases has been carefully analysed, and the observations contained in this paper are based upon the main findings. I do not propose to deal fully with the subject but to call attention to the chief features of interest and importance. My 28 cases included 22 born in the Liverpool Maternity Hospital, 1 born at home and admitted to the Maternity Hospital for treatment, and 5 private cases.

The name given to this disorder is not very satisfactory, but there is no possibility of improvement until the ætiology is known. The disease presents a clear-cut clinical syndrome characterised by the sudden onset, generally between the first and fifth days of life, of hæmorrhage without obvious cause. The bleeding is generally external; melæna and hæmatemesis are the most common varieties, but sometimes the blood comes from the umbilicus, the vagina, the urethra, or the mucous membranes. Internal hæmorrhage is less frequent (see Lundqvist [11]), and in my experience gross bleedings into the suprarenal glands, the peritoneal cavity, or under the capsule of the liver and spleen are generally of traumatic origin. I have not included any of these cases in my series, though it must be admitted that a baby which has a greatly increased bleeding tendency may suffer internal hæmorrhage from some slight trauma which would not affect a normal infant. This aspect of the question may be of considerable medico-legal importance.

The disease is dramatic in onset and is often very dangerous, for loss of blood is badly borne by young babies; they can ill spare the deprivation of fluid, proteins, and iron, and the observer whose mind is accustomed only to the standards of adult life may forget that even a few ounces of blood lost by a new-born baby is to be regarded as a severe hæmorrhage. Not every new-born baby which bleeds is suffering from hæmorrhagic disease, and in my opinion the following requirements must be satisfied before the definite diagnosis is made:—

(1) Careful examination of the family history and of the obstetrical details of labour must exclude causes such as hæmophilia, asphyxia and birth-trauma, and spurious hæmorrhage due to swallowing of maternal blood.

(2) Clinical examination of the infant must be complete and thorough, in order to exclude examples of secondary hæmorrhage—e.g., sepsis, syphilis, gastro-enteritis—genital crisis of the new-born, and mouth injuries.

(3) The age of the patient must be less than 7 days when bleeding begins. The only possible exception is the rare case of umbilical hæmorrhage beginning when the cord-stump separates.

(4) In slight cases of hæmatemesis or melæna the mother's nipples must be examined for cracks or fissures which may have caused "spurious" neonatal hæmorrhage.

Frequency.—Various authors state the frequency as 1 in 600 to 1 in 300 births. In my series I can make the calculation only on the 22 babies born in the Maternity Hospital, and for these the frequency is 1 in 520 births.

Sex.—The sexes are equally affected.

Maternal and obstetrical influence.—I do not find that the age or general health of the mother has any bearing, but it is of some interest to note that 16 out of the 28 babies were either the first or second born. Neither the character of the labour nor the type of anæsthesia given to the mother seems to have any influence; all types of labour, including one birth by Cæsarean section, appear in my series.

Condition of infant.—The babies are generally full-term and of good size; this is somewhat surprising, because one might expect fragile prematures to be more often affected. Usually the baby seems to be in perfect health up to the beginning of bleeding; the average age of the child at onset of hæmorrhage (26 cases) was 37½ hours. In one twin-birth (probably monovular) both babies were affected; in another (binovular) only one baby suffered.

Type of bleeding.—Nearly all were cases of melæna, with or without hæmatemesis. There were three examples of umbilical bleeding and one of vaginal; in two cases epistaxis, or urethral or subcutaneous and submucous hæmorrhage, accompanied melæna.

ÆTIOLOGY

I made reference in my previous paper to some of the theories offered to explain the hæmorrhagic disease, but no final conclusions have yet been reached. It is said that in about 40 per cent. of the cases which come to autopsy diligent search will show a very small gastric or duodenal erosion, or an area of hyperæmia which may have been responsible (see Kennedy,[8] Steiner,[16] Bonar,[3] Ritter v. Reuss,[15] Rhenter,[14] and Kobes [9]). This evidence, however, is inconclusive because, if it were possible to make the necessary examination, a similar change might be found in all new-born babies as a result either of the tying of the umbilical cord or of ascending intestinal bacterial assault. Some support for this possibility is provided by careful chemical testing of the fæces of healthy neonates; this has demonstrated traces of blood in 29 per cent. to 64 per cent. of specimens submitted to examination (Bonar [3]; Högler [7]).

Some workers have assumed a low form of alimentary infection—from blood stream, from umbilicus, or from the contents of the intestine—to be responsible, and the work of Hare and Glynn [6] upon lamb dysentery is of interest in this connexion. Definite examples of gastro-enteritis are seen in new-born babies from time to time, but these present a clinical picture which is quite different from that of hæmorrhagic disease, and up to the present the infective theory must be regarded as inadequate.

Recent work on vitamins has led Moore and Brodie [13] to suggest that a lack of vitamin B in the mother's diet may be responsible, for they claim that this avitaminosis results in deficiency of prothrombin in the baby.

It seems likely that fruitful results may be expected from further investigations of blood characteristics in neonates. A number of contributions have appeared (Grob,[5] Maurizio,[12] Beveridge,[1] Kugelmann and Tritsch,[10] Carr,[4] in addition to those mentioned in my previous paper), but no definite conclusions have been reached. These investigations must be carried out by an expert and it is often very difficult in actual practice to obtain specialist services of this kind at short notice. There seems to be little doubt that the bleeding tendency of most babies, as indicated by the coagulation and bleeding times, is increased during the first ten days of life; but a mere increase of this tendency does not seem sufficient to explain the onset of a disease which occurs only once in every 500 infants born.

TREATMENT

Citrated whole blood, obtained from mother, father, or any other healthy donor, should be injected intramuscularly and subcutaneously as soon as the bleeding is noted. It is most important that treatment should not be delayed. The requisite amount of citrate is easily obtained by dissolving a 2-gr. sodium citrate tablet in 3 c.cm. of water, and using 1 c.cm. of this solution for every 10 c.cm. of whole blood. The injection may be made into the outer aspect of the thigh, and it is wise to introduce the needle below the midpoint of the thigh, in a cephalic direction, in order that the puncture may be outside the napkin area and so out of danger of infection. When it is necessary to repeat injections different masses of muscle should be used—for instance, the deltoid region and the abdominal wall. The volume of blood required varies from case to case: in a severe example 20 c.cm. should be given at once, and doses of 10 c.cm. may be repeated every two hours as necessary. Twenty-seven out of my 28 cases were treated by blood injection, and the average volume given per patient was 29 c.cm. The largest volume received by any one infant was 85 c.cm. On two occasions I have transfused the donor's blood into the baby's superior longitudinal sinus, but the operation is difficult, dangerous, and not to be recommended (see Voron and Banssillon [17]). When the injections are made subcutaneously and intramuscularly preliminary typing of the bloods is not necessary.

It is most difficult to assess the value of blood injection because it is agreed that a number of cases, even serious ones, will recover without any special treatment. The physician may unwittingly persuade himself to the view so commonly held by the laity that when hæmorrhage ceases shortly after the injection of blood there must be an intrinsic relationship between the two incidents. Although no such relationship has yet been proved definitely, there are three clinical facts which lead me to believe that this form of treatment is efficacious:—

(1) The death-rate is now definitely lower than it was before the introduction of blood treatment, though this reduction in mortality is offset to some extent by the fact that the older series probably contained a larger proportion of truly septic cases than are seen nowadays.

(2) In cases of umbilical bleeding, when the site of hæmorrhage is visible, I have seen cessation of bleeding within ten minutes of the injection of blood.

(3) I have been impressed in a number of cases by the general improvement which quickly follows the injection. It is not uncommon to find that the

restless irritable infant becomes peaceful and falls asleep within half an hour.

Although it would seem theoretically advisable in cases of melæna or hæmatemesis to permit rest for the upper part of the alimentary tract by withholding oral fluids, it must be remembered that contractions of the intrinsic musculature are probably increased by hunger, and it is clearly established that strict deprivation of fluids is more dangerous to the baby than feeding on rational lines.

If blood is injected immediately the diagnosis is made, it is not necessary to withhold oral fluids for more than three hours. The infant may then be given a 2-oz. feed of aspirated maternal milk, which should be repeated at two-hourly intervals for 24 hours. During this period the baby is not lifted from its cot, and care is taken that the supply of external heat, by carefully guarded water-bottles, electric lamps, or electric blankets, is adequate but not excessive. When breast-milk is not available a 10 per cent. solution of glucose in water may be used in the same dosage. Subcutaneous or intraperitoneal saline injection may be necessary in severe cases; rectal salines are seldom advisable. It is usually safe to lift the baby gently to the mother's breast about 24 hours after the onset of the illness, but the child should not be moved, even for this, if the local and general signs do not support the view that hæmorrhage has probably ceased.

Drugs given orally to control hæmorrhage are probably valueless. In umbilical bleeding a thorough trial should be given to local measures, such as ligature of the base of the cord and the application of hæmostatic substances (adrenaline, tannic acid, perchloride of iron, silver nitrate); but blood injections should be given in addition. During convalescence gr. 1 of reduced iron or iron and ammonium citrate should be given twice daily. Fresh air, sunlight, and a proper diet are clearly indicated, while carefully regulated doses of ultra-violet radiation may be valuable in some instances. Marmite, one half of a teaspoonful twice daily, has been employed in recent cases.

PROGNOSIS

The chances of recovery depend upon the weight of the baby, the amount of blood lost, the rapidity and adequacy of effective treatment by blood injection, and the presence or absence of infection or sepsis. My own experience during the past 12 years leads me to think that the disease is somewhat less severe than it was. Three deaths occurred in my series of 28 cases, giving a mortality-rate of 10·7 per cent.; my cases were consecutive examples and included a number of premature infants as well as one moribund baby seen in private practice.

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TROPICAL ULCER AS A DEFICIENCY DISEASE

TREATMENT WITH INJECTIONS OF CALCIUM

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TROPICAL ulcer (syn. tropical phagedænic ulcer) is a well-recognised clinical entity with a somewhat patchy distribution throughout the tropical and semi-tropical belts. The observations here recorded apply only to the Bugwere and Bugishu districts of Uganda, as my knowledge of conditions at first hand is limited to these parts, but I see no reason why the method of treatment here discussed should not be applied with equal success to other communities.

The morbidity-rate from this disease is admittedly enormous; its precise extent is unknown, but may be guessed from the fact that at every hospital and sub-dispensary in the two districts ulcer cases outnumber all other cases together by more than two to one. If left untreated, death ensues in nearly every case. Hospital records do not show a high death-rate from the disease because the patients usually run away after a few months' trial of hospital methods, and out-patients attend only sporadically; inquiries among the chiefs, however, elicit the information that these patients almost invariably die after returning to their villages. Speculation is often inaccurate, but there is good reason to suppose that in its mortality and morbidity tropical ulcer may take its place with malaria, plague, and trypanosomiasis.

ÆTIOLOGY

The disease attacks both sexes equally, especially during adolescence, a fact which should not be lost sight of when we consider it as a metabolic disorder. It has been confused in the past with syphilis and yaws, and it is difficult to decide what part these diseases may play in the ætiology of tropical ulcer among heavily infected communities. Nearly every variety of organism has, at one time or another, been blamed for producing this condition, but in no case has the evidence adduced been convincing.

A useful contribution to the ætiology of tropical ulcer is that of McCulloch,[1] who found in his cases a high figure for blood-sugar and a low one for blood-calcium and urea. His actual words are: "Tropical ulcer is a dietetic ulcer, and the question of causative organisms need not be considered at all." With these views my therapeutic results are in complete agreement.

The fact that spirochætes and fusiform bacilli, for instance, are found constantly in these lesions is of no scientific value ætiologically, for it is the exception for such organisms to be absent from any wound of skin or mucous membrane in tropical countries. Furthermore, I have not yet found, in the literature devoted to this subject, any evidence of more than one of Koch's postulates having been fulfilled. The undoubted fact that tropical ulcer may assume epidemic proportions should not prejudice opinion too strongly in favour of the bacterial theory, without investigation of the general conditions obtaining at the time of such epidemics. For example, the Carrier Corps of natives during the last war, in the years 1914–18, was said to have suffered from an epidemic of tropical phagedænic ulcer. But here we are

dealing with a community removed from its natural surroundings and living under conditions of diet and climate widely different from those to which it is accustomed. It would be as rational to insist that scurvy and famine œdema were bacterial diseases, because they frequently assumed epidemic proportions.

A significant fact in the ætiology of tropical ulcer is that it is found almost exclusively among the poorest classes. The well-to-do native is as susceptible to other diseases as the poorest; he is usually infected with malaria, and frequently with syphilis. His mode of living is in many cases identical with that of the poorer native, with the sole exception of diet. Here the difference is startling. The average chief's diet in the Bugwere and Bugishu districts of Uganda, for instance, is as follows:—

Staple food.—Unripe bananas cooked, sweet potatoes. Daily milk.
Supplementary.—Beef twice weekly, chicken twice weekly, rice and eggs occasionally.

Most of the other natives, however, live on the following:—

Staple food.—Unripe bananas cooked, sweet potatoes. Milk only if they possess cattle.
Supplementary.—Beef perhaps once a month, often less.

Native beer is taken by both classes, and consists of various fermented vegetable products.

Hospital records show that tropical ulcer, as distinct from syphilitic and framboesial ulcer lesions, is never met with among chiefs or their families, while it constitutes one of the most frequent diseases among other classes.

A further significant point in the ætiology of this condition is found in the Buganda Province, especially in the neighbourhood of Kampala. Here the Baganda are, in the main, well-to-do, and have a good meat and milk ration in addition to bananas, rice, and sweet potatoes. Nearly all the menial work—e.g., that of porters—is done by immigrants from Ruanda, who receive a small wage and live on a purely vegetable diet without any supplement in the way of meat or milk. Among the ulcer cases seen in that part of the country, the vast majority are the Ruanda labourers, and extremely few are found to be local Baganda.

Taking all these facts into consideration, a dietary cause for tropical ulcer is at least as likely as a bacterial. We have, however, no direct guide to which element of the diet might, by its diminution or absence, be responsible for the disease. According to McCulloch's researches, calcium is constantly deficient in the blood of these patients, while the calcium content of the soil, in Uganda at any rate, is known to be poor. These last two observations are suggestive, but by no means conclusive, in attributing tropical ulcer to a calcium deficiency. As in other deficiency diseases, however, the therapeutic test adds considerable weight to what is, after all, mere speculation.

CLINICAL OBSERVATIONS IN SUPPORT OF A DEFICIENCY THEORY

(1) The onset of a tropical ulcer is usually ascribed to a pre-existing local injury, though in many cases no such injury has been present, and the ulcer in these cases begins as a small papule which in a short time breaks down and discharges a thin offensive fluid. This secretion is a product of tissue necrosis, and bears no resemblance to inflammatory exudates.

(2) According to other observers,[2] there is often a small areola surrounding the papule, but this I have never been able to see on the African skin. At all events, there are no other signs of an inflammatory reaction; pain is usually slight or absent at this stage, there is no increase of heat in the part, and lymphangitis and lymphadenitis are not seen.

(3) Rapid destruction of tissue follows, with a variable amount of pain, dirty slough and discharge, and an advancing edge which shows no evidence of an inflammatory reaction. Pain becomes a marked feature only when tendons, periosteum, or bone are involved. Later, œdema is usually present around the lesion, and later still, evidence of secondary infection may be observed. The whole aspect of the condition, however, is one of tissue necrosis on a large scale rather than of inflammation. The clinical picture of an old-standing case in the foot, for instance, is highly suggestive: the blackened necrosed stumps of the tarsal bones project from a mass of unhealthy granulations, among which may be seen the mummified remains of muscles and tendons. The patient is cachectic and exhausted, while the temperature remains normal or subnormal and general signs of a pyogenic infection are absent.

(4) Treatment locally with antiseptics does not produce any marked improvement. Thorough scraping, with removal of necrosed bone, may bring about slow healing, but as often as not the ulcer slowly regains its former characters and remains indolent until the patient dies of exhaustion or intercurrent disease. As an illustration of the indolent nature of these ulcers I may quote Langeron,[3] who by his local applications (which, incidentally, include calcium), reduced the time of healing of a 16 cm. ulcer from 240 to 91 days! General treatment has also proved disappointing. Salvarsan and other arsenical compounds do not produce rapid amelioration, while antimony, though successful in many cases when used for a long period, is by no means a certain cure. This fact should be given due prominence when considering the spirochætal or protozoal theories of causation of tropical ulcer.

TREATMENT WITH CALCIUM INJECTIONS AND RESULTS

In September, 1931, treatment of tropical ulcer with calcium injections was instituted at Mbale Native Hospital, and later at the seven sub-dispensaries in the Bugwere and Bugishu districts. In all, about 500 patients have so far received this treatment.

Method.—Calcium chloride grs. 15 in 10 c.cm. of distilled water are daily injected intravenously. For children, from 5 to 7 grs. are injected intravenously, according to age. Local treatment consists of eusol dressings twice daily only. The first few injections usually cause almost immediately a disagreeable feeling in the mouth and at the site of the ulcer. This is by no means a disadvantage among native patients, who consider it a sign of the efficacy of the remedy.

Results.—The first and most remarkable result of calcium treatment is the disappearance, in three or four days, of every trace of offensive odour. There have been no exceptions whatsoever to this rule; that this was not due to the eusol dressings is shown by the fact that many patients who had been under various treatments previously, including eusol dressings, without losing this stench, did so as soon as they received calcium injections.

Within the first week of treatment the slough separates, and healthy granulations appear in the base of the wound. Diseased bone separates spontaneously or, if merely patchy on the surface of a long bone, is absorbed. After ten days the ulcer is clean; there are no exceptions to this rule either. Healing of the ulcer begins from the edge, and is rapid in most cases, though a few, while remaining

clean, heal very slowly indeed. This is partly due to the difficulty in keeping the patients in bed, and in several cases has been due to their scratching off the new epithelium as soon as it has formed. The general condition of the cases treated with calcium injections improved along with the local healing. Many, especially adolescents, gained weight, and showed a desire to return to an active life before the ulcer had completely healed.

Tabulation of results.—In assessing the results obtained and tabulating them satisfactorily, difficulty is experienced in several ways, a few of which I may mention here.

Ran away.—This is unfortunately a very common entry on the case-sheet when dealing with primitive African tribes. Some run away because they are tired of hospital after spending several months as in-patients; others run away after a few days because routine and diet do not accord with their tastes. These latter comprise all the cases marked "Ran away. No improvement," and had an average stay in hospital of only 1·4 weeks.

The second and larger class of "ran away" comprises those whose ulcers are practically healed, usually with only ¼ inch square of non-epithelialised surface remaining. These I have called *ran away; almost cured*, for statistical purposes, though for practical purposes they could be considered cures. To judge by other patients who had reached a similar stage in the progress of healing and did not run away, another week would have seen a complete cicatrix.

Almost cured.—These are cases similar to the above who, however, have not run away but still have a small area of non-epithelialised surface at the time of writing.

Improved.—In these cases the ulcer is clean and active healing is taking place, usually at the rate of ¼ inch a week on the whole of the circumference. Many of these started as ulcers of 9 inches or more in diameter and, though healing well and perfectly clean, take some time to epithelialise completely.

The three patients who died were all old men, in very poor condition. Two succumbed to pneumonia and the third to diarrhœa, possibly due to amyloid disease; permission for a post-mortem examination could not be obtained.

The first 69 cases treated with calcium chloride injections are here discussed (see Table); 35 of them had had in-patient treatment with arsenical and other metallic compounds, as well as local dressings, for a period of up to six months. There was roughly an equal number of either sex. The number of patients treated was 69, the average age 19·2 years, the average previous duration of ulcer 8 months, and the average duration of calcium treatment 4·8 weeks.

—	Number and percentage.	Treatment (weeks).
Cured	15 (21·7)	4·3
Almost cured	8 (11·6)	7·0
Ran away; almost cured	13 (18·8)	4·4
Improved	10 (14·5)	6·5
Ran away; improved	12 (17·4)	4·3
Ran away; no improvement	5 (7·2)	1·4
No improvement	3 (4·4)	4·0
Died	3 (4·4)	6·1

N.B.—No improvement merely means that no healing has taken place. All the ulcers are clean and free from stench. Of the three cases thus tabulated, one ulcer is based on elephantoid tissue and one is clinically syphilitic, though no improvement took place previously on salvarsan and bismuth treatment.

As these cases did not all begin to receive treatment on the same date, and are admitted almost daily for a course of calcium injections, it is impossible to exclude such items as "almost cured." At whatever date statistics are taken there will always be comparatively recent arrivals who have not yet attained complete healing. It must be remembered that all cases marked "improved" are making steady progress from week to week.

Thus we may group the results in the following way:—

	Per cent.		Per cent.
Cured or almost cured	52·1	No improvement ..	11·6*
Improved	31·9	Died	4·4

* Of these several remained under treatment for less than one week.

The results obtained at the sub-dispensaries, in charge of native dressers, have been equally encouraging. The treatment lends itself to application on a large scale, providing that sufficient dressers experienced in intravenous therapy are available. Apart from the obvious advantages of this treatment, the saving in dressings and other more expensive drugs is sufficient to commend it in hospital work.

CASES

CASE 1.—Man, aged 18. Duration of ulcers, seven months. Previous treatment with antimony and bismuth, two months, without improvement. He had two ulcers, one on the left shin, measuring 3 in. by 2 in., and one on the left foot, which had amputated the middle three toes. Both ulcers were highly offensive and showed no sign of healing. Sept. 17th: treatment with calcium injections started. Sept. 28th: no smell; dry healthy granulations almost covering the base of each ulcer. Oct. 9th: active healing at the whole circumference of each ulcer. Nov. 4th: completely healed; discharged.

CASE 2.—Woman, aged 22. Brought her child to hospital as it was suffering from malaria and marasmus. She was feeding the child at the breast, and both were in a debilitated condition. One week after admission to hospital she developed an ulcer over the right external malleolus. Two days later a course of injections with salvarsan compounds and bismuth was started, and a month later, as there was no improvement, antimony was tried. After five months of treatment the ulcer measured 5 in. in diameter and, in spite of frequent dressings, was extremely offensive and lined with a dirty slough. Oct. 23rd: treatment with calcium injections started. Oct. 30th: all smell and slough disappeared, revealing some periosteal necrosis. Since then healing has taken place very slowly, possibly due to the drain of calcium through lactation. Incidentally the child, which had previously not reacted to treatment with quinine and cod-liver oil, began to improve within a week of its mother receiving calcium injections, and is now in good health.

On Dec. 22nd the mother's ulcer was half its former size, perfectly clean, and healing steadily.

CASE 3.—Boy, aged 15. Previous duration of ulcer nine years. Previously had antimony and bismuth treatment for four months without improvement. He had an ulcer measuring 11 in. by 8 in. on the front and inner side of the right leg, involving the tibia. He had several hæmorrhages from the exposed medulla, and on one occasion was found unconscious in the hospital grounds, having lost several pints of blood. Amputation was being considered, but in view of the successful progress of Case 1—our first case to receive calcium injections—it was decided to give this treatment a trial in his case. Sept. 28th: calcium injections started. Oct. 9th: healing began. Nov. 25th: the whole crater had filled with healthy granulations; epithelialisation was progressing rapidly, and the remaining uncovered portion measured 2 in. by 1 in. On this day he scratched the edges of the wound and infected it badly, so that almost the whole of the new epithelium stripped off. Dec. 22nd: healing has again taken place, and now the remaining unhealed portion is roughly the same as on Nov. 25th.

CONCLUSIONS

1. Tropical ulcer is one of the great causes of death and disability among African natives. 2. There is little evidence in favour of a bacterial cause, whereas its ætiology from the dietary point of view deserves consideration. 3. Treated by daily intravenous injections of calcium chloride, the great majority of patients showed rapid healing. This treatment constitutes a definite advance, in that it is superior to all others both therapeutically and economically. 4. Approximately 500 cases of tropical ulcer have received this treatment, and the first 69 personally observed are analysed.

I am much indebted to Dr. C. R. Wallace, senior medical officer, Mbale, for his enthusiastic help in arranging that

this routine calcium treatment should be carried out on all ulcer cases in the hospitals and sub-dispensaries under his control; for many valuable suggestions, and for his assistance in the production of this paper.

My thanks are also due to Major G. J. Keane, director of medical and sanitary services, Uganda, for permission to publish this paper.

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HYPERTROPHIC PYLORIC STENOSIS IN ADULTS

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THIS condition has received scant recognition in England. On the continent attention was first directed to its possibility by Landerer in 1879; whilst in England, in 1904, Mayo-Robson and Moynihan described two cases. Since then a few isolated authentic cases have been reported in America, and Walton,[1] in his text-book of "Surgical Dyspepsias," remarks on two cases of his own. The following case possessed a complication not present in those so far described.

CASE RECORD

History.—The patient was a married man, aged 38, a platelayer, and he complained of periodical attacks of abdominal pain for seven years, with vomiting for the last two years. During the earlier years of this period upper abdominal pain came on regularly two to two and a half hours after meals. The periods of freedom from pain were as long as six months, but they had become progressively shorter, and the pain had increased in severity so that his appetite was affected. Eventually the pain became almost continuous; it was a dull gnawing ache, but became more acute within five minutes after a meal and induced belching and vomiting, which to some extent relieved it. Recently he has had typical "hunger pains" relieved by taking food or a bismuth mixture.

There was no history of hæmatemesis or evidence suggestive of melæna. Recollection of any gastro-intestinal disturbance in infancy was hazy and indefinite; 18 months before he had been investigated for supposed duodenal ulcer, and screening had shown suggestive evidence of a chronic ulcer low down on the lesser curvature with a tendency to spasm near the pylorus. It was considered that most of his symptoms were due to alcoholic gastritis, but strict dieting and abstinence from alcohol failed to ameliorate them.

Examination.—The patient was pale and thin and had a normal temperature. His teeth were mostly in good condition, except for slight pyorrhœa in the upper and lower incisors. The chest was long and thin and the epigastric angle narrow. No abdominal tumour was palpable, but there was a point of deep tenderness just to the right of the mid-line, a third of the way up between the umbilicus and the epigastric notch. No scars of previous laparotomy were present. There were no other physical signs. The test for occult blood in the stools was negative, as was also the van den Bergh reaction in the blood. The blood count was within normal limits. A fractional test-meal showed a small quantity of resting juice, absence of free HCl, a low total acidity, and fairly free regurgitation of bile. A barium meal showed a low hypotonic stomach with persistent contracture of the greater curvature near the pylorus. There was no deformity of the duodenal cap or delay in emptying of the stomach. No ulcer niche was seen, but the spasm was thought to be due to a pyloric ulcer.

Operation.—Mr. A. J. Gardham operated on Nov. 27th, 1931, and found a firm elastic mass surrounding the pylorus, ending abruptly on the duodenal side but gradually thinning and extending for some 1½ inches on the stomach side. The peritoneal surface was smooth and free from any evidence of inflammatory or neoplastic disturbances. Two small soft lymph glands were palpable in the subpyloric region. On the anterior surface of the stomach near the lesser curvature and 3 inches from the pylorus the stomach wall was thickened and œdematous, and the peritoneum greyish-white, with punctate hæmorrhagic speckling; the lesser omentum opposite this region was thickened. The stomach was not dilated. Gastrectomy and anterior gastro-jejunostomy (using the Balfour modification of Polya's operation) was performed. The patient made a rapid recovery, and at the time of writing is completely relieved of symptoms.

Specimen.—The resemblance of the pylorus projecting into the duodenum to the cervix uteri projecting into the vagina was marked, but the orifice was circular and patent. The tip of the little finger, when pushed through this opening from the pyloric side, was gripped by what felt like a ring of unyielding tissue; there was no grating on cutting the pylorus. The cut surface showed the tumour at the pyloric ring to be due to a muscular hypertrophy fully half an inch thick, stopping sharply at the duodenum but fading gradually into normal thickness of muscularis on the stomach side. The mucosa showed a moderate degree of chronic gastritis, but was freely mobile over the muscularis in the region of the pylorus. The puckered scars of healed chronic gastric ulcers corresponded in position to the external appearances observed on the stomach. Fig. 1 shows the muscular hypertrophy clearly and the healed ulcers in the top right-hand corner.

Microscopical section (Fig. 2) showed very great hypertrophy of the circular muscle-fibres, stopping sharply at the commencement of the duodenum, as indicated by the presence of Brunner's glands. The same region was also demarcated by the longitudinal fibres of the stomach turning up towards the mucosa, and conceivably acting as a sphincter to the pylorus in this region. There was an increase of interstitial tissue between bundles of muscle-fibres, consisting mainly of compressed fibrous tissue and looser fibres mingled with cells which were endothelial in type; but there was no inflammatory exudate. The mucosa showed the changes of gastritis, and there was considerable lymphoid tissue in the submucosa and diffuse infiltration with chronic inflammatory cells, but no suspicion of malignancy.

COMMENT

Landerer regarded pyloric stenosis in adults without hypertrophy or dilatation of the stomach as a congenital deformity. Maier [2] in 1885 added 21 further cases, most of which came to post-mortem examination on account of non-gastric diseases. The gastric clinical histories, when known, are very sketchily described; but he recorded two young adults who had complained of abdominal pain since early youth, and several others with histories extending over many years. He concluded that there exist pure cases of round or slit-like congenital narrowing of the pylorus. These may be complicated by a congenital muscular hypertrophy or catarrh of the stomach; some are also combined with either a congenital or a very early acquired abnormal fixation of the pylorus, due to an extraordinarily thick ligamentum hepaticum duodenale and gastro-hepatic omentum.

Mayo-Robson and Moynihan [3] in 1904 described two cases: in the first, a child aged 11 years, who had suffered from infancy with general abdominal disorders and vomiting, laparotomy showed a muscular hypertrophy of the pylorus; in the second, aged 24 years, with five years' duration of symptoms, operation revealed a contracted pylorus without any evidence of organic disease. They considered that these conditions might explain dilatation and catarrh of the stomach in young adults, or the persistent vomiting usually labelled "hysteria" or "pernicious habit."

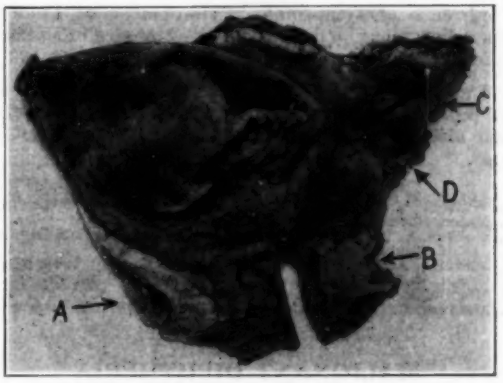
Maylard [4] mentioned 15 cases which showed at operation a dilated stomach without muscular hypertrophy, ulceration, or neoplasm, but a uniformly narrowed pyloric aperture (between 2 and 12 mm. in diameter), just admitting the tip of a finger. The interior of the stomach was inspected by direct vision in all these cases, and gastro-enterostomy completely relieved all symptoms. He thought his cases congenital in origin, but was careful to emphasise that they were in no way akin to hypertrophic pylorus stenosis, although he considered that the latter condition probably existed in adults.

Crohn [5] in 1928 recorded the case of a nurse, aged 45, who suffered all her life with epigastric pain and vomiting. Marked pyloric stenosis with gastric dilatation eventually developed. At operation a mobile pylorus, free from inflammatory changes but resembling an enlarged replica of the condition in infancy, was found. He believes this to be a case of mild congenital hypertrophic stenosis of infancy, not sufficiently severe to interfere with nutrition and managing to survive to adult life.

Mr. Julian Taylor recently told me of a child aged 6 years who was an undoubted case of pyloric stenosis of infancy, treated medically, and who still shows visible stomach peristalsis. Finally, Morton [6] (1930, two cases) and McClure [7] (1931, four cases) described examples in adults varying in age between 31 and 51 years, the duration of symptoms in two cases being throughout life and in the remainder from 12 years to 6 months. At operation all showed a hypertrophied pylorus without apparent organic cause.

Omitting the cases of Maier and Maylard (of pyloric stenosis without muscular hypertrophy), there appears sufficient evidence to justify the view that the so-called congenital hypertrophy of infantile stenosis may persist throughout life. Probably there are patients with mild unrecognised pyloric hypertrophy in infancy who recover under medical treatment, and the condition may be only discovered at autopsy after death from some other disease. Some, less fortunate, complain of abdominal symptoms throughout life, whilst still others, after many years of freedom from symptoms, may undergo some complicating change that may demand surgical aid. The case now described seems to fall into this last group; in it gastritis and ulceration have apparently added to the pyloric disturbance and increased the symptomatic significance of the anatomical deformity. These factors, acting reflexly on the pylorus, may have been sufficient to upset the balance of the mechanism of the transference of contents between the stomach and duodenum, and so be responsible for the onset of gastric symptoms. It is not proposed here to analyse further the causation of the pain, but merely to indicate sufficient cause for its pyloric origin after many years of latency.

FIG. 1



A and B, cut ends of hypertrophic pylorus. C and D, sites of the ulcer.

It is interesting to speculate on the similarity of the possible source of origin of symptoms in the congenital and adult cases. In the former, symptoms commence only after a latent period of some ten days or more, thus allowing for the development of gastritis on a deformity already present at birth. So, in the latter, it is suggested that the onset of gastritis was at the root of the commencement of symptoms, only after a latent period of many years. The end-result is not always necessarily pyloric obstruction, as has been stressed by previous writers and is exemplified by the case here described.

The alternative hypothesis is that the muscular hypertrophy is acquired. Chronic gastric ulceration, as in this case, situated well away from the pylorus, can hardly be incriminated for such a degree of hypertrophy; and when juxtapyloric ulceration causes stenosis and gastric dilatation, local muscular hypertrophy is never an observable feature. So far as I am aware no corresponding muscular hypertrophy has been described in other sphincters of the alimentary tract, nor is there any evidence to justify the assumption that chronic spasm may cause muscular hypertrophy. I cannot find any evidence to support Maier's contention of abnormal fixation of the pylorus as a possible ætiological factor.

A clinical review of the recorded cases shows the importance of eliciting a history of gastric disturbance in infancy. Symptoms may commence in early adolescence and middle age, and are those of recurrent indigestion suggestive of chronic ulcer, whilst some may be typical of a dilated stomach. No abdominal tumour could be palpated in any of the cases, but tenderness over the pylorus is common. A barium meal is important, and shows spasticity or a persistent filling defect of the pylorus; but the duodenal cap remains normal and an ulcer niche is never seen in the neighbourhood. There may be gastric delay

FIG. 2

Microscopical section showing hypertrophy of the circular muscle-fibres stopping sharply at commencement of duodenum.

Except when complicated by gastric ulceration—and this would appear to be quite uncommon—the occult-blood test is negative; little help can be expected from a fractional test-meal.

Gastro-enterostomy or gastrectomy, when there is doubt as to the cause, is rational and successful treatment. In two cases pyloridosis was performed, and a second operation was necessary on account of recurrence of symptoms. Pyloroplasty or Finney's operation must be difficult in the presence of so much thickening and loss of flexibility of the pylorus.

I am indebted to Prof. C. C. Choyce for permission to publish this case and for much help and advice, and also to Mr. Julian Taylor for the record of his case.

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MALIGNANT DIPHTHERIA

TREATMENT WITH GLUCOSE AND INSULIN

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The death-rate from diphtheria in Leeds has steadily risen from 0·04 per 1000 inhabitants in 1928 to 0·19 in 1931. The number of cases admitted to the Leeds City Hospital for Infectious Diseases has increased from 600 in 1928 to 984 in 1931. The type of disease has become much more severe, with a rise in case-mortality from 3·05 per cent. to 8·4 per cent. With increase in severity in type there has been a more than corresponding increase in the dosage of antitoxin, and, as the treatment has been largely in the hands of the same medical staff, the variable factor of personal judgment has to some extent been eliminated. Results of treatment with large doses of antitoxin, even if administered in the early stages of the disease, have often been disappointing.

One patient, for instance, who developed diphtheria in a scarlet fever ward, was given in all 160,000 units of antitoxin. Of these, 120,000 units were given within 12 hours of the first symptom, 100,000 being administered intravenously. Palate paralysis occurred on the fifth day and between the 27th and the 38th days there were four convulsive attacks with loss of consciousness for several hours and dilatation of the heart. The patient, a little girl of 6, eventually recovered after multiple paralysis and was discharged 16 weeks after the onset of the disease.

It was therefore decided to attempt an auxiliary line of treatment by giving intravenous glucose together with intramuscular insulin, as suggested by Schwentker and Noel [1] as a result of their researches into the disorders of carbohydrate metabolism occurring in diphtheria. During the last 18 months 28 cases of diphtheria have been treated by this method. Of these, 3 are not included in the series because they were not extremely severe. The other 25 cases would all have been classified as severe according to Bie's grouping,[2] and death was likely in every case. Many of the patients were extremely toxic, showing either delirium and excitement or drowsiness, amounting at times to unconsciousness. There were six hæmorrhagic cases. The youngest patient was 2 years old, the oldest 32. The average age was 10·8 years. The duration of disease before admission was 1–5 days, with an average of 3·4 days.

The routine treatment was as follows. On admission, 20,000 units of antitoxin were given intramuscularly. Two or three hours later 20–40 c.cm. of a 50 per cent. solution of glucose in distilled water were given intravenously together with 20,000–40,000 units of antitoxin intravenously and 10–20 units of insulin intramuscularly. This treatment was followed by daily doses of intravenous or intramuscular antitoxin until the membrane began to clear, or at any rate ceased to spread. The largest total dosage of antitoxin was 120,000 units. In the first few cases a second dose of glucose was only given occasionally, but in all the later cases, following on the results of the Birmingham workers,[3] the glucose has been repeated daily, the largest number of intravenous injections given in any one case being nine. Each was, of course, accompanied by insulin.

Attempts were made to give glucose by mouth (for instance, in the form of sweetened lemon water), but many of the patients rejected it and appeared to have an absolute distaste for anything sweet.

RESULTS

Among the first 14 cases treated, up to the end of 1931, there were only 2 recoveries (14·2 per cent.), but of the next 11 cases 6 survived (54·5 per cent.), giving a recovery-rate among 25 cases of 32 per cent. Age is, of course, an important factor in diphtheria and, as one would expect, the older patients responded better to the glucose treatment than did the younger ones (cf. Table I.). Of the 8 surviving cases, 7, or

TABLE I

—	Cases.	Age in years.		
		Youngest.	Oldest.	Average.
All fatal cases of diphtheria, 1931	82	2	47	6·8
All glucose-treated cases ..	25	2	32	10·8
Fatal „ „ „ ..	17	2	16	7·6
Recovered „ „ ..	8	4	32	17·25

87·5 per cent., developed paralysis, usually multiple. In the 1 surviving patient who did not develop paralysis, it is significant that the bacillus was of the *mitis* type.[4] It was possible to type 16 other cases (of which 11 were fatal), but in each of these the organism was of the *gravis* type. Of the 17 fatal cases, 5 only, or 29·4 per cent., lived long enough to develop paralysis; 3 of these had palate paralysis on the sixth, seventh, and eighth days, and died on the 13th, 14th, and 10th days respectively. One patient died on the 49th day and one on the 53rd, both with multiple paralysis. The average day of disease on which death occurred among all glucose-treated cases was the 12th or, if the two long cases above mentioned be set aside, the seventh. The earliest day of disease on which any case proved fatal was the second.

During the period under review a small series of severe cases was treated with antitoxin alone, intravenously and intramuscularly. The largest total amount of antitoxin given was 160,000 units, of which 100,000 units were given intravenously. Of these cases the most severe, 11 in number, were comparable in type with those selected for glucose and insulin treatment. Table II. shows a comparison of the results of the two series. In many cases as severe as

those included in these series intravenous treatment was found to be impossible on account of technical difficulties. The veins of small children are not always easy to negotiate, and in severe cases of all ages the veins collapsed very readily, especially as the disease advanced. One patient, a boy of 8, was given intravenous injections with ease on the fourth day of disease; on the fifth, it was quite impossible to get into any vein and on the sixth he died. In many cases, when the needle had entered the vein, the slightest pressure from the syringe caused exudation into the surrounding tissues. Experience in the treatment of malignant diphtheria shows that continued intravenous medication is difficult and frequently impossible. Emphasis must be laid on this point.

TABLE II

—	Total cases.	Fatal cases.				Recovered cases.			
		Total.	Fatality-rate.	Developed paralysis.	Paralysis-rate.	Total.	Recovery-rate.	Developed paralysis.	Paralysis-rate.
G.I.A.	25	17	68%	5	29·4%	8	32%	7	87·5%
A.T.	11	9	81·9	3	33·3	2	18·18	2	100

G.I.A. = Cases treated with glucose, insulin, and antitoxin.
A.T. = Cases treated with intramuscular and intravenous antitoxin.

Blood-sugar was not estimated as a routine. In 11 of the 25 cases of the glucose-insulin series the fasting blood-sugar was estimated once by the method of Folin and Wu. A reading outside normal limits was never found, even when the sample was taken—as in one case—two hours before death on the fifth day of disease. This does not seem to bear out the finding of other workers that there is usually an initial hyperglycæmia in the malignant cases. Anything in the nature of a routine tolerance test was considered to be out of the question. Veins, if not collapsed, were far too precious to be used for this purpose, and usually the patients were too ill to be upset by more needle insertions than were absolutely necessary. Several attempts were made to use the alternative method of Crecelius and Seifert,[5] but even here there was such difficulty in obtaining enough blood from an ear or finger that the attempt was abandoned.

The results of so small a number of cases as 25 can have no statistical value; one can merely gain impressions from them. The death of a patient from severe toxic diphtheria is often preceded by extreme discomfort and distress. One certainly gets the impression that, after treatment with glucose and insulin, this discomfort and distress (even in patients who succumb rapidly) are relieved. The relief is often so marked that in the short period before death the patient's friends find it difficult to believe that he is dying and not steadily improving. The treatment is perhaps worth while from this point of view alone. There are in diphtheria roughly two danger periods. Patients who succumb during the first period usually die within the first fortnight. Those who pass through the first period may survive or may live one or two months—an average of about six weeks—only to die after the development of multiple paralysis. In a series of 69 fatal cases occurring in 1931, not treated by glucose and insulin, only 18·8 per cent. survived to the second danger period. One is therefore encouraged to investigate further an auxiliary line of treatment by means of which 10 out of 25 apparently hopeless cases, or 40 per cent., survive to the second danger period, and 8, or 32 per cent., recover.

I am indebted to Dr. J. S. Anderson, superintendent of the Leeds City Hospitals, for his advice and for permission to publish these cases.

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Clinical and Laboratory Notes

HÆMOLYTIC ANÆMIA

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A SINGLE woman, aged 23, a café manageress, was admitted to the Manchester Royal Infirmary on April 14th, 1931. She complained of attacks of vomiting and palpitation coming on every few weeks and lasting several days at a time.

In 1928 (three years before admission) she had been employed in a dye works. At this time she was set to work with a new yellow dye (whose constituents we are unable to ascertain), but she very soon developed anæmia and was away from work for six months. When she returned to work she was not completely well but felt "run down" and became easily tired. In 1930 she had an attack of jaundice which lasted for 16 weeks, and on returning to work she was again not completely well but lacked energy and felt "out of sorts." She had felt like this ever since.

In 1931 (some months before admission) she began to have attacks of vomiting. These attacks occurred at intervals of several weeks, and lasted for two or three days at a time; the vomit was bile-stained.

The appetite was poor and the bowels constipated, the stools usually being dark-coloured. Menstruation was regular, but the duration of the period had diminished from ten to three days. There were no urinary symptoms or œdema, but she had dyspnœa and palpitation on slight exertion.

Clinical examination.—The patient was pale and slightly yellow. Tongue, teeth, and fauces showed no abnormality. Systolic and diastolic murmurs were heard all over the præcordium, loudest over the mid-sternum; there was no cardiac enlargement. The lungs and abdomen were normal; the liver and spleen were not palpable. The central nervous system was normal. The Wassermann reaction was negative. Hæmolysis of red cells began in 0·46 per cent. saline, and was complete in 0·28 per cent. saline. The blood count showed:—

Red cells	960,000	Polymorph.	54·75%
White cells	3,000	Lymphocytes	42%
Hæmoglobin	20%	Large mononucl.	3·25%
Colour-index	1·05	Eosinophils	None.
Reticulocytes	44%	Basophils	None.

Punctate basophils numerous; marked anisocytosis and poikilocytosis. Abundant platelets.

Progress.—On admission, on April 14th, the pallor and yellow colour suggested pernicious anæmia, although the blood film was not typical of this condition. A fortnight later the blood count was lower and the blood picture did

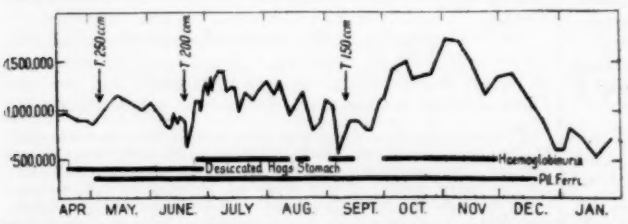
not resemble that seen in pernicious anæmia. The general condition was worse and the yellow colour more pronounced; four days later the patient had a blood transfusion of 250 c.cm. The blood count improved (see graph) and the general condition became better.

During the next six weeks the blood count gradually diminished, and on June 19th a second transfusion of 200 c.cm. was given. Immediately after the transfusion the blood count sank very low, but after four days it rose rapidly to over 1,000,000 (see graph), and at the same time hæmoglobinuria began. Radiography revealed no abnormality of the urinary tract, and cystoscopy showed blood-stained urine coming from each ureter. From the end of June until September the jaundice became gradually deeper and the patient weaker. The blood count fluctuated as shown on the graph, hæmoglobinuria being observed whenever the erythrocytes reached 1,000,000, and ceasing when they sank below 1,000,000. On Sept. 10th another transfusion of 150 c.cm. was given, and a fortnight later the blood count rose suddenly. As it passed 1,000,000 hæmoglobinuria returned.

At this time the skin was pigmented a dark bronze colour, but microscopical examination of a section did not reveal the nature of the pigment, which failed to stain with fuchsin, and gave no reaction for iron. The urine was a deep mahogany colour, and gave a strongly positive benzidine reaction, while the spectroscope showed the presence of oxyhæmoglobin. Microscopical examination showed no red cells in the urine, and tests for bile were negative.

At the beginning of December vomiting began and became increasingly frequent; hæmoglobinuria ceased and the temperature became irregular, fluctuating between 98·4° and 102° F. During the first week in January the jaundice became almost black and the urine deeply bile-stained. The patient, who until now had been very cheerful and intelligent, became mentally dull. At the end of January she sank into a stuporose condition, and the liver and spleen became palpable. On Feb. 3rd she died, and for some hours before, the liver (which had rapidly enlarged to below the umbilicus) pulsated visibly.

Post-mortem examination.—There was no enlargement of the heart, but fatty degeneration and "tabby cat" striation were seen, and the left ventricle was somewhat dilated. There was no other abnormality of the heart or pericardium. The lungs and pleuræ were normal except for an appearance of jaundice on the cut surface of the lungs. The gastric mucosa was a diffuse prussian blue colour, but otherwise normal. The duodenum was finely stippled all over with blue-black granules. The large intestine, peritoneum, and omentum were normal. The liver weighed 1750 g., and was bright brown in colour from gross deposits of hæmosiderin, which gave the prussian blue reaction. The centres of the lobules were pale and yellow. The gall-bladder and pancreas were normal, and the latter showed no pigmentation. The spleen, which weighed 270 g., was enlarged, fairly firm, and of normal colour. The thyroid was pale, and contained much yellowish colloid, which was very



Graph showing the red cell count and its relation to treatment. T = blood transfusion. The horizontal lines indicate the periods of hæmoglobinuria and the periods during which the patient received desiccated hog's stomach and pil. ferri.

sticky and exuded from the cut surface. The kidneys were enlarged; the right weighed 250 g., and the left 220 g.; the cortex was wide and of a deep chocolate colour. The adrenals were rather small but otherwise normal. The genital glands and ducts were normal. The marrow in the shafts of the femurs was bright red, with fine spicules of bone throughout.

Microscopical examination of organs.—The centres of the lobules of the liver showed very advanced fatty degeneration. The cells in the portal tracts showed hæmosiderin, but not in such quantities as in the kidneys. The Küpffer cells were also filled with hæmosiderin. The endothelial cells throughout the spleen were loaded with hæmosiderin. The organ was congested but otherwise normal. The first convoluted tubules and descending limbs of Henle showed pigmentation of their epithelium. The pigment was in coarse brown granules about 2μ in diameter. The mitochondral zone of the cells consisted of hæmosiderin. The adrenals showed no hæmosiderin. All the vesicles of the thyroid were very large and distended with homogeneous colloid. There was gross œdema of the lungs and hyperplasia of the bone-marrow, but the latter contained no hæmosiderin.

Similar cases have been reported in which great benefit was derived from splenectomy. This was considered in the present case, but could not be carried out owing to the poor general condition. Three blood transfusions were given in an attempt to prepare the patient for operation, but on each occasion she developed pyrexia and hæmoglobinuria. The occurrence of hæmoglobinuria is a feature for which we are quite unable to account, and post-mortem examination threw no light upon it.

We wish to thank Prof. A. Ramsbottom, under whose care the patient was, for permission to publish this case; also Prof. S. L. Baker, who placed the post-mortem notes at our disposal.

TWO UNUSUAL CASES OF DIVERTICULOSIS

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THESE cases are put on record as pathological curiosities, with the added interest of the coincidence that they were admitted to hospital at a comparatively short interval.

CASE 1.—A married woman, aged 72, was admitted to the Hampstead General Hospital on March 28th, 1932, under the care of Dr. Adolphe Abrahams, complaining of feeling weak. She stated that she had been quite well until five weeks before, when she had experienced fairly acute pain in the right hypochondrium, accompanied by nausea. When seen by a doctor she had been found to be jaundiced, with a temperature of 100° F., and a pulse-rate of 80. The abdomen had been slightly rigid all over; the gall-bladder had been doubtfully palpable. No cyanosis had been noted. Her condition had improved, jaundice and pain disappearing, and after two weeks she had felt able to get up, whereupon the pain and jaundice had recurred. Later the jaundice had disappeared, but pain had persisted in the right hypochondrium, pyrexia also being present. The stools had been rather pale throughout the illness, and she had vomited soon after food during the last few days. She had suffered for three years from flatulence.

On *admission* she was cachectic, but had no obvious jaundice and no cyanosis. Her temperature was 102° F., her pulse-rate 130, and her respiration-rate 20. Her tongue was furred and dry. There were no palpable glands in the neck, and no enlargement of the heart. The sounds were normal. Her blood pressure was 132/80. The percussion note was dull at both bases and the air entry poor, especially at the left base. The breath sounds were vesicular. Crepitations were heard at both bases. The abdomen was somewhat distended generally. The upper part was rigid, and an indefinite mass was felt in the epigastrium. There was no evidence of free fluid. The urine was acid and had a specific gravity of 1020. It contained no albumin, sugar, or bile. A few hours after admission the patient had a rigor, collapsed and died.

Post-mortem examination (Dr. C. Rickword Lane).—Apart from a little clear fluid in the left pleural cavity and generalised fatty changes in the viscera, the only pathological findings were in the abdomen. There was a small collection

of purulent fluid in the pouch of Douglas, and numerous small diverticula of the large gut from the cæcum to the sigmoid flexure. The pouches were mainly thin-walled sacs, the gut wall being unthickened except in the descending colon, where some reactionary thickening had occurred. The stomach was adherent to the liver and, on attempting to separate adhesions, pus and black necrotic tissue exuded from a large abscess cavity the size of a fœtal head occupying the lesser sac. The foramen of Winslow was closed by adhesions. The tail of the pancreas was completely destroyed and replaced by dark hæmorrhagic necrotic tissue. The surrounding omentum and mesentery showed fat necrosis. The spleen, left kidney, and splenic flexure formed the left border of the abscess cavity. The splenic vessels were lying free in the pool of pus, but showed no signs of erosion. The splenic flexure showed four diverticula, one of which had perforated. A probe could be passed through the opening into the abscess cavity. The common bile-duct was dilated but patent; the gall-bladder was nearly empty, containing only a few drachms of "white bile."

The sequence of events appears to have been: perforation of diverticulum of splenic flexure into the lesser sac with the formation of an abscess and a final acute hæmorrhagic pancreatitis. Pressure of the abscess upon the common bile-duct had caused the original jaundice. The ante-mortem diagnosis was non-committal during the short time possible for observation and investigation. The character of the pain and jaundice were in favour of a gall-bladder condition: ? inflammatory, ? neoplastic. The physical signs resembled those of carcinoma ventriculi with secondary deposits in the left chest.

CASE 2.—A married woman, aged 66 years, was admitted on April 15th, 1932, with the following note:—

"Became acutely ill 14 days ago with what was apparently cholecystitis. The attack subsided, but she has acute pain in the left loin which shoots into the perineum. Temp., pulse, and respiration normal. Nausea and constipation noted."

On admission she complained of pain starting from the interscapular region and radiating down the right side to the groin and leg; also of vomiting, at uncertain intervals, a greenish vomitus. She gave a history of jaundice in 1915 preceded by attacks similar to the present one. Constipation was admitted and recently the stools had been pale.

On *examination* her temperature, pulse, and respiration were normal, and her tongue furred and dry. She was an obese woman, and no definite physical signs were obtained beyond tenderness in the right subcostal region. The urine was normal in all respects (it contained no bile-salts or pigment). Her condition remained the same until the night of April 17th, when she had a definite rigor, the temperature rising to 102° F. for a brief period. On the following day the pains were worse. Ill-defined jaundice was noticed, most marked in the sclera. On April 19th she had complete suppression of urine, which persisted in spite of treatment until her death on April 21st. The temperature remained subnormal throughout, apart from the rigor.

Post-mortem examination (*Dr. Rickword Lane*).—An abscess starting in the tail of the pancreas immediately posterior to the splenic flexure of the colon tracked along the inferior surface of the pancreas as far as the neck. The pancreas was involved to the depth of the splenic vessels. The head of the pancreas was inflamed and necrotic in patches. Some fat necrosis was present, but in small areas only. The porta hepatis was cut off by adhesions and was full of greenish pus. A well-marked caudate lobe was covered with thick green pus. The gall-bladder was thickened and contracted and the cystic duct very much enlarged, as was also the common bile-duct, so that a finger could be passed from the gall-bladder to the duodenum with ease. The liver showed the abscess tracking along the portal entry vessels, and large septic infarcts were distributed throughout the organ. Minute embolic abscesses were found in the right lung, both kidneys (which were otherwise normal), and visceral pericardium. There was an inflamed diverticulum in the region of the tail of the pancreas, but the actual track could not be followed.

Other organs showed the usual changes expected at the age of the patient, but were not significant.

The cases are of interest from two points of view: clinically, the syndrome of pain in the right hypochondrium and jaundice was misleading; pathologically, diverticulum is an unusual cause of acute pancreatitis and portal pyæmia. Acute pancreatitis is commonly associated with and is the result of infection in the gall-bladder. Infection of the pancreas as a result of perforation of a diverticulum must be excessively rare. Molesworth [1] describes a case of perforation of diverticulum of the duodenum giving rise to acute pancreatitis, but we have found no record in the literature of this condition arising in perforation of a diverticulum of the splenic flexure, in itself a rare event.

There are several cases on record [2] of suppurative pyelophlebitis and portal pyæmia following suppuration of diverticula of the sigmoid colon, but not of the splenic flexure. In two cases only were found systemic metastatic abscesses.[3,4] It is of further interest to note that the splenic vein was not thrombosed in either case, although surrounded by pus.

We are indebted to Dr. Abrahams and Mr. Sydney Boyd for permission to publish these cases, and to Dr. Lane for the post-mortem reports.

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THYROID ADMINISTRATION IN A DIABETIC WITH MILD HYPOTHYROIDISM

BY A. W. HENDRY, O.B.E., M.D. ABERD., M.R.C.P. LOND.
ASSISTANT PHYSICIAN, ABERDEEN ROYAL INFIRMARY

A WOMAN, aged 24, height 57½ in., weight 66 lb., was in 1925 admitted to Aberdeen Royal Infirmary. She suffered from fairly severe diabetes mellitus, and a moderate degree of exophthalmic goitre. In addition to thirst, glycosuria, wasting, and hyperglycæmia, there was exophthalmos, tachycardia, nervousness, and tremor.

A glucose-tolerance test was as follows:—

		Per cent.
Fasting blood-sugar		0·287
40 minutes after 50 g. glucose		0·306
80 minutes after 50 g. glucose		0·366
120 minutes after 50 g. glucose		0·441
180 minutes after 50 g. glucose		0·416

She was treated for the diabetes; no special measures were instituted for the hyperthyroidism. Her diet consisted of seven "line-rations," and she had 10 units of insulin thrice daily. On this régime she remained sugar-free till September, 1926, when it was found necessary to increase her insulin to 13 units thrice daily. This increase rendered her sugar-free, and her weight increased to 98 lb. In May, 1927, the basal metabolic rate was +56 per cent., and the signs of hyperthyroidism had lessened. In August, 1927, she had an attack of diabetic coma, and there was another in August, 1930. After the latter attack she seemed to be balanced with seven line-rations, and 80 units of insulin per day. Her weight was now 112 lb.

She remained fairly well for a time, but in October, 1931, was admitted with still another attack of coma. She was very ill, and it was a considerable time before she came round. After recovery from the coma great difficulty was experienced in adjusting her diet and insulin. On eight line-rations diet she received 35 units of insulin thrice daily, and yet the urine contained a large amount of sugar and acetone. On this régime the blood-sugar, two and a half hours after a meal, was 0·420 per cent. At this juncture several points forced themselves on the attention. In a small person eight line-rations ought to have been sufficient to keep her comfortable if the sugar were metabolised. Even if she had no capacity to use sugar 20 units should have been enough. Our patient was having eight line-rations and 108 units of insulin per day, and yet her blood-sugar was 0·462 per cent., with marked glycosuria and ketonuria. The insulin somehow was not functioning.

In searching for cause or causes of this absence of insulin action, it was ascertained that her basal metabolic rate was now −7 per cent., whereas previously it had been above normal. Hyperthyroidism had gone, but there were no clinical signs of myxœdema. The increased weight was attributed to the diabetic treatment. My chief, Dr. Thomas Fraser, put her on thyroid (whole gland) gr. 1 per diem, and there was a dramatic change. Daily she suffered hypoglycæmic attacks. The blood-sugar, two and a half hours after a meal, was now 0·081 per cent. After an interval, during which the diet and insulin were adjusted, it was found that now, with this daily 1 g. of thyroid, she was sugar- and acetone-free on a nine line-ration diet, with 45 units of insulin per day.

During the last six months her condition has remained excellent on this treatment. She looks the picture of health. She goes about a lot and enjoys life. The urine throughout has always contained some sugar, but there has been no ketonuria.

These are the facts of the case. In a diabetic with slight hypothyroidism, insulin became inactive and without effect; when thyroid was given insulin activity manifested itself. In this case, it is considered, insulin activity was conditioned by the thyroid, because other factors in the case were not altered. The patient required increasingly large doses of insulin to maintain the desired therapeutic effects. This tolerance was markedly lessened by the presentation of a small dose of thyroid. The findings would lead one to suspect that insulin is not the only hormone necessary for the normal metabolism of sugar and fats—that insulin does not in all cases solve the whole problem in diabetes.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY, SUBSECTION OF PROCTOLOGY

AT a meeting of this subsection on Oct. 17th, with Mr. W. S. PERRIN, the President, in the chair, a discussion on the

Treatment of Cancer of the Rectum

was opened by Dr. R. C. COFFEY, of Portland, Oregon. In former days, he said, cancer of the rectum was placed on the borderline in regard to operability; but now it was conceded that of all parts of the body this region was the one which could best be devascularised and freed from cancer-ridden tissues. Nowhere was early operation more certain to bring about a cure, and in this respect cancer of the rectum was certainly more favourable than cancer of the breast. Most of the blood-supply to the rectum and sigmoid colon, and to the connective tissue and fat in the hollow of the pelvis came via the superior hæmorrhoidal artery, and most of the return was through the corresponding veins, accompanied by lymphatics, which constituted almost the sole avenue of spread of the disease upward. These vessels could be secured by a single ligature above the sigmoid, thus removing the danger of upward metastasis during the operation. Ernest Miles preferred the one-stage operation, but others, perhaps equally skilled, would get better results with the two-stage. Until there was new and contradictory knowledge of the nature and mode of spread of cancer, no vital change was possible in the one-stage operation of Miles, provided a one-stage was chosen.

Three types of two-stage operation had been devised in America: (1) the Mayo operation, which was used in this country at the same time by Lockhart-Mummery; (2) the Jones operation; and (3) the operation practised by the speaker. In the first part of his operation Dr. Coffey ligatured both internal iliac arteries, the sigmoid was severed, and colostomy was performed. The superior hæmorrhoidal artery was ligated at the promontory, and removal of glands and fat rendered the operation a very complete one; the fat was separated down to the tip of the coccyx, and not more than a couple of ounces of blood need be lost in the whole operation. When all the vessels had been dealt with, the intestine was severed through the clamps. At the lower end an aperture was left for the drainage, which he and his colleagues regarded as absolutely essential. The drainage of the retroperitoneal area or the connective tissue area involved a principle which did not apply to many parts of the body. The retroperitoneal or broad ligament area consisted of a mesh-like substance, which held fluids by capillary attraction, and the only successful drainage of that was capillary drainage; 12 to 36 small wicks were used to suck up the fluid in this area, and these were very effective. This drainage continued while granulation tissue was forming at the bottom of the wound, and the drains were left in situ for about a week.

The second stage of the operation, a week later, did not occupy more than five minutes, because there were no vessels to be dealt with. To leave the coccyx behind was to render the operation unsuccessful, and where it had been left, it was necessary to return and remove it; for here one had to deal with a large bony cavity which was non-collapsible in at least half its circumference, and so must heal by granulation.

In Dr. Coffey's experience recto-sigmoid cancer had a mortality of 23·6 per cent., as against the 6·5 per cent. in all the work he and his colleagues had been doing in the last 15 years by the inversion method. That difference was not due to the situation of the cancer; it was because in the case of the higher growths one was dealing with intestinal obstruction and the accompanying toxæmia. In those cases obstruction was usually the first symptom, and a large proportion of the patients would die of simple colostomy. Cæcostomy was also necessary.

Some surgeons advocated a "local" operation. This might be all right in the hands of the expert, but it was bad teaching, since many surgeons must lack the correct judgment as to what was best in a given case. In 1928 Dr. Coffey had had 152 cases; 24 were not operated upon, 49 were explored, and removal was carried out in 79. Statistics should never be taken as an absolute guide, for much depended on the manner in which they were compiled; at one stage of his work he had a low average mortality over a considerable number of cases, and then lost two out of three. Of 209 cases on which he had operated until 18 months ago, 47·8 per cent. were operable.

Dr. Coffey said he was now gradually coming to the three-stage operation, though he regarded Mr. Miles's dicta as gospel. In an advanced case one should first do colostomy and cæcostomy; the cæcum could be held up and the gas should be withdrawn with a trocar, enlarging the opening and inserting a mushroom catheter by Hendon's method; then sutures were put across it so that it could not be pulled out. Afterwards this was pulled up and the end was cut off. After doing colostomy and cæcostomy, the case could be dealt with as if it were one of cancer of the rectum alone.

DISCUSSION

Sir CHARLES GORDON-WATSON agreed about the importance of preliminary colostomy, and also supported Dr. Coffey's method of quarantine drainage. The abdomino-perineal one-stage operation was not, he thought, an essential one for radical excision, and he believed that it was not called for in early cases, especially where the growth was below the peritoneal reflexion; also, it was a dangerous operation, except in the hands of the most expert. For growths at the recto-sigmoidal junction some form of two-stage abdominal operation was safer and wiser; and where the growth was high he considered it was neither necessary nor desirable to remove the rectal ampulla.

Mr. ERNEST MILES said that Dr. Coffey's mortality figure of 6·25 per cent. for the two-stage operation was extraordinarily good. And he thought the method now described could scarcely be excelled. He personally had always lacked the courage to do a two-stage operation, for two reasons. The first was that the perineal portion of the operation took such a short time, provided the abdominal portion of the operation had been done, and he therefore hesitated to subject the patient to a second anæsthesia and operation to complete the removal. His other reason was that he had hesitated to lock up in the lower abdomen a portion of tissue which had been devascularised and which was thus liable to septic necrosis, for all rectal carcinomata were very septic. In his first series of abdomino-perineal cases the mortality was 33 per cent., but that had now been reduced to 7·6 per cent., and the reduction had been brought about by methods other than making it a two-stage operation—i.e., by a change in the anæsthetic and in a number of small details. In his early cases the anæsthetic used was open ether, and this resulted in a distinct lowering of the blood pressure, so that a number of his patients succumbed to the shock of the operation. The substitution of gas-and-oxygen and spinal anæsthesia with intrathecal stovaine at once reduced his mortality to 17 per cent. though the anæsthesia did not last longer than 45 minutes. He now used a caudal block with 2 per cent. novocain extrathecally, and this gave complete anæsthesia of the perineum for two or three hours. As a result of that, the mortality was reduced to 9·8 per cent.; and since he had made use of blood transfusion it had been 7·6 per cent. He was now using percaine, which gave anæsthesia for five or six hours.

No form of operation for cancer was of avail unless it could show a low recurrence-rate. Cancer of the tongue showed such a high recurrence-rate that surgical removal had now been abandoned for radium and diathermy. The most malignant cancers of the rectal region were the colloidal and melanotic, and it was likely in these that before operation could be done the disease had already spread beyond the confines of even the biggest operation. The papilliferous and adenocarcinoma showed a good freedom from recurrence. He agreed as to the great value of Dukes's classification, but no one could determine clinically that a case belonged to A, B, or C category.

Mr. J. P. LOCKHART-MUMMERY said that the need was for an operation which would cure the largest number of cases with the least risk, and the one which did that best was the perineal operation, carried out in two stages. The difficulty was that it could not be done in cases of high growth. As the second stage which had been discussed did not occupy more than five minutes, he did not see the necessity of a second operation. In earlier days two-thirds of the cases were lost from sepsis, and surgeons in the last 20 years had been concentrating upon getting rid of this source of danger. He did not say sepsis was not now met with, but aseptic results were now being obtained in these cases. He liked to get the pelvis to heal up without drainage. Surely the mortality now reached in these operations should be considered to be low, bearing in mind that the patients' ages ranged from 55 to 70 years, when resistance was notoriously much lower than in life's full tide. The great need was to get cases of cancer of the rectum at an earlier stage than at present; this was apparently the only hope of reducing the mortality still further.

Mr. W. TURNER WARWICK spoke as one who for some time had used and advocated the Coffey two-stage operation. Using the perineal excision for low rectal and anal growths, and the two-stage operation for high growths, he maintained that the surgeon with an average amount of experience could deal satisfactorily with all operable cases of rectal cancer. He had operated upon 12 patients by the Coffey method without a death. For his own purposes he had made modifications in the procedure, one of which was to drain the subperitoneal space through a stab wound at the side of the coccyx, and another was always to cut the external sphincter, for that increased the comfort of the patient. One of the greatest advantages of the Coffey operation was that it enabled the pelvic diaphragm to be retained, and the patient was left a whole man.

Mr. W. B. GABRIEL considered the Coffey operation particularly valuable for ampullary cancer. In the recto-sigmoid cancers there was the difficulty in invaginating the rectum where the fat must be trimmed off the bowel.

Dr. COFFEY, in reply, said the advocates of the various operations were not really far apart from each other. Until he evolved the operation he had been describing he practised colostomy plus perineal resection. Resecting the growth of the rectum and preserving the sphincter could be done by an operator with the necessary judgment, but almost all the noted surgeons who had done that had subsequently abandoned it. There was a place and a kind of case for all the operations, and in choosing one of them the economic circumstances of the patient could not be altogether left out of account.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

AT a meeting of this society, held on Oct. 13th at 11, Chandos-street, London, W., with the President, Prof. W. LANGDON BROWN, in the chair, Dr. LEONARD SEIF, of Munich, read a paper entitled

The Individual and the Community

Dr. Seif said that the relation of the individual to the community is the central problem of individual psychology. Every science has an object. In individual psychology man is regarded as a human or fellow being. It inquires whether the expressions of any one person are those of a fellow man or of a counter man. Reality, as the framework of life, is closely connected with each of the aspects into which the task of life may be divided—namely, society, work, and sex. After discussing these questions, Dr. Seif passed on to consider the part played by the

absolute helplessness of the infant in developing the inborn tendency to overcome its "burning sense of inferiority." As growth and accomplishment reduce the gulf between the child and its surroundings, so do personal and egotistic interests tend to decrease; in this way some harmony between personal and social interests is made possible. He touched upon the factors which influence this development, and the rôle of the mother in promoting an atmosphere favourable to the production of courage and self-confidence.

The two words, courage and the community, he said, are characteristic of individual psychology. Courage is especially important, for without it true community feeling is not possible. As a viewpoint for distinguishing between different individuals, courage is better than intelligence, æsthetics, or morals. The intelligence of the courageous individual is quite different from that of the anxious or frightened person who tends to ask "What do people think of me?" "Do I like people?" and so on. This egotistic standpoint is especially apt to occur where an organ inferiority is present, or where the parents have misunderstood the child and have treated him wrongly. Both spoiling and snubbing foster excessive self-feeling. In the one case the children want what they feel to be their right, in the other they want what they have never had.

Dr. Seif indicated the ways in which confidence furthers a healthy relationship between the individual and the community, whereas a sense of deficiency is associated with the occurrence of neurotic, psychotic, or criminal tendencies. He regarded it as the aim of individual psychology to increase the courage and confidence of those with whom it deals, and so to create a more liveable world.

DISCUSSION

Dr. T. LAWSON said that Dr. Seif had spoken of the distance of the child from its environment and the duty of the parents to teach the child its social relationship, and asked whether the community feeling was latent or had to be taught.

Dr. F. G. CROOKSHANK spoke of the significance of the inferiority feeling upon which Dr. Seif had laid stress. He illustrated the interdependence of the individual and the community by an asylum story, in which the attendant, at the end of an observation which he had made as to the possible recovery of one of the patients, remarked "You may take it from me, Sir, a lunatic never has no friends."

Dr. O. H. WOODCOCK was interested in the way in which Dr. Seif had dealt with the rising generation, and with its need to learn to meet the world. He spoke of the value of the community feeling as taught by individual psychology, and suggested that the secret for the salvation of civilisation might be found here.

Dr. JAMES YOUNG agreed with the emphasis laid on the importance of the attitude of the individual to life. He observed that Dr. Seif had shown the philosophic or humane background of individual psychology.

Prof. LANGDON BROWN asked whether a neurotic could be a lady or a gentleman, since he was always trying to take more out of the common stock than he put in. He spoke of the responsibility of parenthood in giving some sense of security. The removal of the sense of insecurity found in so many patients was more important than growing cultures from their excretions.

Dr. SEIF, in reply, said that social feeling was inborn. In the course of his treatment the individual learnt to become what he really was, but had not had the chance to develop. The neurotic wished to give the appearance of coöperation. Sugar was more nourishing than saccharine, but the latter was many times sweeter. Individual psychology was one of the best foundations for a sound sociology. True love was associated with self-reliance and coöperation.

HUNTERIAN SOCIETY

ON Oct. 17th, at the first meeting of the session, Dr. NATHAN RAW delivered a presidential address entitled

Human and Bovine Tuberculosis

About 8 per cent. of samples of milk delivered into the large towns in England contained living tubercle bacilli, he said, while the deaths from tuberculosis in children up to 10 years of age were estimated at about 3000 per annum in Great Britain. This, however, did not represent the enormous amount of permanent crippling and deformity in those who had survived an attack. The eradication of tuberculosis from dairy cows was undoubtedly one of the most serious problems of the day, and the only real solution was to prevent the infection of calves. As early as 1906 Dr. Raw came to the conclusion that good results could not be obtained by the use of virulent cultures; accordingly, he secured pure cultures of the three strains of the tubercle bacilli and commenced the attempt to attenuate these by repeated sub-culture. Until the eighty-fourth generation of the culture no change in the virulence was noticeable. After that time, however, attenuation became marked, and the result of a long series of experiments had been the conclusion: (1) that it is possible to render the tubercle bacillus non-pathogenic; (2) that a vaccine prepared from this avirulent organism has enhanced immunising properties and can be used with perfect safety in large doses. The method adopted was the injection of cultures of human bacilli grown in the laboratory for 23 years, which were non-pathogenic and avirulent. So far, between 6000 and 7000 calves, chiefly of pedigree stock, had been immunised. The vaccine was injected when the calf was a week old, and again at the end of two weeks; and very satisfactory results had been obtained. He also used 23-year cultures in the treatment of human tuberculosis, again with very satisfactory results. They caused no reactions, no increase of pulse-rate, and no general disturbance.

Dr. Raw then discussed the question of mutation. Is it possible, he asked, that the bovine bacillus when introduced into the human body in children may lie dormant in the tissues for many years, and becoming adapted to its new environment, may assume the characteristics of a human bacillus, and thus set up human tuberculosis? It was certainly very difficult to explain why the bovine bacillus should almost invariably attack children, and why the human bacillus should so frequently attack the lungs between the ages of 18 and 25. These were questions of immense importance, and he put forward a few problems which awaited solution. Thus: (1) What is the life history of the T.B. before it enters living tissues? (2) Has it undergone a previous mutation? (3) Is infection of the lungs respiratory or alimentary? (4) Does direct respiratory infection from person to person occur? (5) Why do bovine infections in the human occur in childhood chiefly? (6) Why does

pulmonary tuberculosis (primary) occur in early adult life chiefly? (7) Does the bovine bacillus from long residence in human tissues become transmuted into the human type, and so produce lung infection? (8) Does a bovine infection of the human body produce immunity against the human bacillus and vice versa? (9) Does a reinfection ever occur in the human? (10) Can tubercle bacilli in human tissues be destroyed? (11) Is the infection ever antenatal? (12) Is there any hereditary predisposition to infection?

In conclusion, Dr. Raw strongly urged the appointment of a Government departmental commission to consider the best methods of dealing with and supplying milk to the public.

REVIEWS AND NOTICES OF BOOKS

Accidents, Neuroses, and Compensation

By JAMES H. HUDDLESON, Associate in Neurology, Columbia University. With a Foreword by J. RAMSEY HUNT, M.D., Sc.D. London: Baillière, Tindall and Cox. 1932. Pp. 256. 21s.

OPINIONS about traumatic neuroses range from the still surviving belief in physical trauma of the central nervous system to a condemnation of the sufferer as a malingerer. Dr. Huddleson, whilst avoiding this condemnation, has no doubt as to the part played by compensation in the maintenance of these disorders and urges that public opinion should be educated to awareness of its ultimate disadvantages. His study of the problem, involving citations of over 300 authorities, is thorough and bears the mark of an extensive personal experience. The introduction is devoted to the discussion of structual versus non-structural theories of the psychoneuroses, with the excursion into metaphysics to which such discussion of necessity leads. In the chapter on ætiologies the consideration of many opinions leads to the conclusion that "social sanctions increasingly attach responsibility for injury, monetary reparation, and recovery of health, to an individual or group other than the injured. With the growth of this tendency goes an enhanced incidence of traumatic neurosis, swelling demands for compensation, and more justifiable suspicions of exaggeration or malingering." Under the heads of classification and symptomatology the traumatic neuroses are considered without any hint of relationship to non-traumatic psychoneuroses—to those "nervous breakdowns," for example, which in the statesman or society lady are perfectly respectable. The result is unsatisfying to psychopathologists who take a wider view. The methods of treatment described range from torpillage—the surprise painful attack which cures; only to be permitted in times of military necessity—to the hypnotic treatment of amnesias, and there are useful warnings about the harmfulness of prolonged physical treatments. War material is freely drawn upon, and the author describes the difficulties in the restoration to psychoneurotic veterans of their self-reliance and sense of responsibility, difficulties largely due to continuous compensation. In a final chapter is summarised recent work in America and this country on the psychological side of accident prevention.

The book is likely to rouse opposition, but anyone familiar with industrial cases must admit that compensation for psychoneuroses has greatly increased their duration and incidence. The advocacy of no compensation, or a small lump sum made absolutely final, with energetic treatment and speedy replacement at work, stands in contrast to the common attitude, not always limited to the patient and his friends, that the neurosis is an exogenous infliction for which the injury is entirely responsible and for which the only remedy is ample compensation. A difficulty, in this country at least, is that there are few facilities for that treatment without which the psychoneurotic workman may be compelled to cling to compensation as his only hope. The consideration of Dr. Huddleson's proposals calls for a wider knowledge of the psychoneuroses than exists at present, but with that caution the book is recommended as a vigorous presentation of an important subject.

Urology in Women

By E. CATHERINE LEWIS, M.S. Lond., F.R.C.S. Eng., Surgeon to the Royal Free Hospital; Surgeon and Urologist to the South London Hospital for Women. London: Baillière, Tindall and Cox. 1932. Pp. 76. 6s.

IN this book the emphasis laid on urological conditions found in female patients should be very useful, especially to those whose experience of urology has been mainly confined to the male sex. Miss Lewis has had ample opportunity, as surgeon to the Royal Free Hospital and urologist to the South London Hospital for Women, of accumulating special experience of genito-urinary conditions peculiar to women, and has here placed the fruits of this experience at the disposal of the profession. The differences between the anatomy of the lower urinary tract in men and women render each liable to certain lesions which do not appear in the opposite sex, and it is with these that Miss Lewis deals rather than with diseases common to both. The section on the bladder is particularly helpful, since chronic cystitis is one of the commonest and most difficult conditions to combat amongst female maladies. We regret that she has not included in this chapter functional conditions, particularly functional frequency and enuresis. Another omission which we would like to see remedied in a future edition is nephroptosis, which is a condition found far more frequently in the female than in the male.

The work is well illustrated, the text clear, and the handling of the subject matter practical. This little book should certainly make and keep a place for itself in urological literature.

Principles of Preoperative and Postoperative Treatment

By REGINALD A. CUTTING, M.D., C.M., Assistant Professor of Surgery, Louisiana State University Medical Centre. New York: Paul B. Hoeber, Inc. p. 812. $10.

THIS book is both a work of reference upon recent advances in applied physiology and biochemistry, and a practical manual of pre- and post-operative treatment. Dr. Cutting possesses the qualifications essential to the writer of a good medical book: a wide and accurate knowledge of scientific literature, sound critical common sense, and a scholarly and lucid style. All recent investigations of real importance are discussed and explained in this volume, and in every case an attempt is made to assess the value of methods of treatment, while the author is careful to recommend no procedure which does not rest upon a sound basis, and which has not been adequately

tested. In a few places he is content to place the evidence for and against some method before the reader, and to allow him to draw his own conclusions. The standard is good throughout and it is difficult to pick any part for special commendation; but the chapter upon blood transfusion may be mentioned as a practical treatise upon all aspects of the question, and that upon disturbances of acid-base equilibrium as a clear exposition of a subject that is apt to puzzle the reader whose laboratory days are far behind him. This book is a valuable addition to medical literature, and specially useful to the candidate for the Primary or Final Fellowship examinations. The print is excellent; the illustrations clear and well-chosen.

Electrotherapy and the Elements of Light Therapy

By RICHARD KOVÁCS, M.D., Clinical Professor and Director of Physical Therapy, Polyclinic Medical School and Hospital, New York. London: Henry Kimpton. 1932. Pp. 528. 30s.

THIS book will be read with interest by those who practise medical electrology and actinotherapy in this country. Doctors who wish only to learn the character and therapeutic properties of the different currents and rays for the purpose of prescribing treatment may find it too detailed, but specialists will appreciate an account of the experience and methods of American workers.

The introductory account of electrophysics is illustrated by helpful diagrams; Fig. 42, which shows the different electrical symbols, is especially instructive. The various currents, and the methods of utilising them, are well described. More space is devoted to the galvanic and faradic currents than in most American books on electrotherapy; on the other hand static electrical treatment, which is much more frequently administered in the United States than treatment by faradic and galvanic currents, receives relatively brief attention. The electrical reactions of muscle and nerves and the methods of testing them by the faradic and galvanic currents are fully discussed, and some notes are given of the uses of condensers for the same purpose. The determination of the chronaxie is briefly explained. Hydro-electrical baths do not receive much attention. The author points out the danger of supplying them with direct current from the main, and says that they must be insulated and that metal fittings and taps within reach of the patient should be avoided as much as possible. This is a scarcely adequate precaution. They should be absolutely out of reach. It is questionable, too, whether treatment by the galvanic current in a full-length bath has much therapeutic value; the quick sinusoidal current, on the other hand, in a full-length bath is really useful. A concise account of the uses respectively of infra-red, visible, and ultra-violet rays in treatment is supplied. The diseases which may advantageously be treated by electrical methods are considered in separate chapters under the headings of the different bodily systems. A chapter on electrotherapy in dermatology is contributed by Dr. J. J. Eller, and one on the treatment of diseases of the ear, nose, and throat by Dr. W. Morrison. A useful chapter on physical therapy in institutional practice concludes the book, which contains a glossary of electrical terms and a good index. Dr. Kovács insists on the importance of correct diagnosis and knowledge of pathology before physical treatment is given. Of diathermy he says that it "should not be used as a panacea for all sorts of undiagnosed painful conditions. A complete diagnosis, a definite conception of the underlying pathology to be influenced, and consideration of the individual equation in each patient are essential for its successful application." The book is well prepared, and the illustrations are clear and helpful.

A Descriptive Atlas of Radiographs

An Aid to Modern Clinical Methods. Second edition, revised and enlarged. By A. P. BERTWISTLE, M.B., Ch.B., F.R.C.S. Edin. London: Henry Kimpton. 1932. Pp. 552. With 767 illustrations. 42s.

THIS clear pictorial review of the scope of diagnostic radiology has now reached a second edition. The radiograms as before are well chosen and representative. Each is adequately described and most of them are accompanied by line drawing reductions as a guide to interpretation. Many are in silhouette, a technique that the author has devised for showing the fleshy outline; the print is blackened outside the margins of the flesh that, in the ordinary print, are either not seen or are only faintly visible. The scheme of the work is systematic, and the balance between the numbers of illustrations devoted to the various systems of the body in this edition seems to be well preserved. It is not clear why small sections should be labelled "nasal system" and "thyroid system." The illustrations are admirably reproduced.

La syringobulbie

By N. JONESCO-SISESTI. With a preface by Prof. GEORGES GUILLAIN. Paris: Masson et Cie. 1932. Pp. 391. Fr.70.

THIS monograph by Dr. Jonesco-Sisesti is based on the clinico-pathological study of a series of eleven cases personally observed. These cases in themselves represent a noteworthy contribution to the literature and are utilised for the study of several physiological problems connected with the functions of the medulla. Among the more interesting of the conclusions that emerge from this fine piece of work may be mentioned the occurrence of syringobulbia with sudden onset and the peculiar diagnostic difficulties such cases offer; and, in particular, the striking disproportion in some instances between the paucity of the symptoms and the severity of the bulbar lesions. To this point attention is also directed by Prof. Guillain in his foreword; he assures the reader that the researches of Dr. Jonesco-Sisesti prove that the medulla is by no means so "fragile" functionally as is commonly imagined, and that grave alterations of presumed "vital" sympathetic centres can coexist with maintenance of life. The volume also contains excerpts from a rich literature which with the personal cases serve as a basis for the discussion of various aspects of bulbar function and of special symptoms; among these are nystagmus, diplopia (it is curious to find authentic diplopia mentioned several times in connexion with bulbopontine lesions), ageusia, hiccup, the Argyll Robertson pupil. Pathologically, cavity formation, commonly latero-dorsal but sometimes mesial, is so constantly associated with glial proliferation as to make it impossible to separate rigidly syringobulbia from gliosis, gliomatosis, or glioma with cystic degeneration. No such complete review of syringobulbia and its particular features has hitherto been available.

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THE LANCET

LONDON: SATURDAY, OCTOBER 22, 1932

THE POLICY OF SCHOOL-CLOSURE

THE recent disbanding of Stowe School "for safety's sake" on the appearance of two cases of poliomyelitis again forces us to question the wisdom of the policy of "school-closure" as a preventive measure. Most authorities believe that poliomyelitis is mainly spread by carriers, or unrecognised infections with the virus; also that carriers generally outnumber cases by more than a hundred to one. Children of pre-school age are more susceptible to, and suffer more severely from, infantile paralysis than do boys of public school age. On these grounds it seems scarcely fair to call the distribution of 500 potential carriers of the virus of poliomyelitis far and wide among the pre-school age-group a safety measure—at least for the community at large. Moreover, the closure of a school a fortnight after the appearance of the first case, as happened at Stowe, makes it as certain as we can be of anything in medicine, that many boys must h ve had time to become infected as virus carriers under the close living conditions of a school. It may be admitted that, for the inhabitants of a school itself, the risk of infection is diminished by school-closure. It can therefore be argued that since school authorities are in duty bound to do their best for the boys under their care, school-closure is their proper action when a serious disease appears among the individuals for whom they are immediately responsible. What happens to the other 40 million odd inhabitants of this island is not the business or responsibility of any school authority, but of the Ministry of Health. But one could imagine the outcry if, on the appearance of small-pox in an institution, the inhabitants were dispersed far and wide, without vaccination or quarantine of contacts. Yet in small-pox we can detect and trace all infected subjects, while in poliomyelitis only a small minority of those infected are discoverable, and what new chains of infection may be initiated by the distribution of unrecognised carriers from a single infected locality to many other districts, we have no means of guessing. In the case of diphtheria we do know that, when carriers from an infected institution have inadvertently been sent home, severe attacks of diphtheria have sometimes been reported among their young brothers or sisters.

The public health problem involved in school closure may be shortly stated thus. Will the number or severity of symptomatic poliomyelitis infections in the country as a whole be increased by distributing the virus carriers of a single infected institution all over the country, to homes where they are likely to meet specially susceptible subjects; or would keeping an infected sub-group isolated, under conditions which are known to favour the spread of the disease, in the end lead to a greater incidence of infantile paralysis in the community as a whole than would be caused by the dispersion of the infected sub-group? Unfortunately there is no certain answer to this question, but it would be more rational, from the little that is known, to confine an infection to one locality, than to risk spreading it to many. On the other hand, nowadays families of public-school boys are small, and perhaps most of Stowe's infected boys will return to homes in which there are no susceptible infants. Moreover, there is no doubt that those virus carriers who have young brothers or sisters are more likely to infect them as carriers than as cases of infantile paralysis.

With a little luck, therefore, it is quite likely that no cases of poliomyelitis may be traceable to the Stowe experiment. But we earnestly hope that Stowe, having made this experiment, will see it through—that the school authorities will try to get a census of the households to which their boys have returned, and a record of all febrile conditions likely to have been poliomyelitis that may possibly arise in these households during the next two or three months. Such data are sadly lacking, and it is only by immediately seizing such opportunities as the present one at Stowe that health authorities can obtain evidence which may enable them to say under what conditions, and for what infections, school-closure is of danger or benefit to the public's health.

THE ÆTIOLOGY OF HODGKIN'S DISEASE

THE results of a concerted attack on an old and much-discussed problem—the ætiology of Hodgkin's disease—by a group of workers at St. Bartholomew's Hospital, are now available in a sumptuous volume just published under the title Rose Research on Lymphadenoma.[1] The inquiry was made possible by an endowment over a period of ten years, provided by Mrs. T. E. Rose in memory of a daughter who fell a victim to this disease. The endowment period came to an end in January, 1930, but fortunately since that date the investigation in its more purely experimental aspects has been continued by Dr. M. H. Gordon, working on behalf of the Medical Research Council. From 1920 to 1926, Dr. C. C. Twort, as the first Rose Research Fellow, carried out various investigations under the Fund which have been published elsewhere. In a brief summary of his work, which appeared in 1930,[2] Dr. Twort admitted that no new light on the ætiology of Hodgkin's disease had emerged, and that he had failed to confirm the observations of previous workers who had claimed to identify certain animal and vegetable parasites as causal agents. He did, however, draw attention to one observation he had made—viz., the occurrence of a local transitory

[1] Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1932. Pp. 136.

[2] Jour. Path. and Bact., 1930, xxxiii., 539.

inflammatory nodule after the subcutaneous inoculation in the guinea-pig of Hodgkin gland material. Control tissue of various kinds only rarely gave rise to such nodules. Attempts to reproduce this "inflammatory" reaction in passage experiment were unsuccessful.

In 1928 a new plan of campaign was adopted. An executive committee consisting of Sir Thomas Horder, Prof. G. E. Gask, Prof. E. H. Kettle, and Dr. Gordon, was appointed to coöperate in the work and to supervise the various lines of investigation. They had the assistance of two Rose Research Fellows, Dr. Kenneth Stone and Dr. James Maxwell, and also of Dr. L. P. Garrod, Dr. E. R. Cullinan, and Dr. Beatrice D. Pullinger. It was early decided to prosecute inquiries along two main lines: (1) a search for organisms belonging to groups that might conceivably be associated with or responsible for lesions of granulomatous nature and which have in the past been suggested as possible ætiological agents in Hodgkin's disease; and (2) a search for a possible virus. The volume has now appeared which embodies the outcome of this joint investigation; it contains contributions by six workers (Horder, Gordon, Stone, Garrod, Cullinan, and Pullinger), and the major contribution, written by Dr. Gordon, is devoted to a detailed account of the investigations under these two headings. In spite of intensive and amply controlled research no evidence was found incriminating spirochætes, fungi, tubercle bacilli, or diphtheroids as primary and essential ætiological agents. The chief interest of the reader will be directed to some novel and unexpected observations of Dr. Gordon bearing on the virus theory of origin. He confirmed Dr. Twort's observation mentioned above, but was also unable to secure transmission in passage experiment. He then proceeded to investigate the effect of intracerebral inoculation of rabbits with Hodgkin gland macerates. For a few days after inoculation the rabbits would remain quiet. This latent period was followed by symptoms of incoördinate gait and paresis or paralysis of extremities. Death usually occurred at periods varying from a week or ten days to two months. Before intracerebral inoculation it was found advisable to macerate the gland material in the cold for a week or more, and with such technique it was possible to produce this "encephalitic" syndrome by inoculation of glands from five out of six recent cases of lymphadenoma and also of a dried gland removed from a fatal case two years previously. Gland material from a fairly extensive series of controls—carcinoma, sarcoma, leukæmia, tubercle, chronic adenitis, and so forth—failed entirely to produce this syndrome when inoculated by similar routes. Passage of the material through a Chamberland L2 filter did not yield a potent filtrate nor was it possible to produce a similar syndrome in normal rabbits by passage of brain material from rabbits which died. The "agent" responsible for the syndrome could withstand desiccation and was unaffected by 30 minutes' exposure to a temperature of 65° C. Curiously enough, the brains of animals which died showed no lesions of the infiltrative character that might be expected in a true encephalitis, and indeed, so far as we are informed in the present report, there were usually no obvious lesions of any kind present at autopsy. What the nature of the agent may be must, for the moment, remain obscure, but further developments will be awaited with interest. As lending some support to the view that Hodgkin's disease may ultimately be found to come within the virus category, attention is drawn to the recent important work in Sweden and Paris on lymphogranuloma inguinale which is now believed definitely to be a virus disease.

In the brief introductory contribution to the volume Sir Thomas Horder discusses the clinical concept of Hodgkin's disease, while Dr. Stone, Dr. Garrod, and Dr. Cullinan contribute useful information on the pathogenicity and serological classification of yeasts derived in the course of the inquiry from Hodgkin glands and other conditions. The volume closes with an important and profusely illustrated study by Dr. Pullinger of the histology and histogenesis of 39 cases of lymphadenoma. This paper demands most careful perusal and will be of interest not only to students of general pathology but to all histologists who may have in the course of their work to express opinions on glands removed for diagnostic purposes. Dr. Pullinger's conclusion is that lymphadenoma is neither a true malignant neoplasm nor a chronic inflammatory condition. She believes that it has most in common with the leukæmias since "like them it is essentially a progressive hyperplasia of one type of cell" (the reticulum cell).

HARVEY AND HIS COLLEGE

IN the Harveian Oration, delivered last Tuesday before the Royal College of Physicians of London by Sir GEORGE NEWMAN, a fresh angle from which to view the patron saint of the College was discovered. This was something of an exploit seeing the number of consecutive years during which a pious estimate of HARVEY'S work and personality has been put on record in these discourses, which however have not followed any common pattern or had any stereotyped lay-out. On the contrary they form a most interesting corpus, and it is a tribute to the hero and his work that there should always be something fresh to say. Truly HARVEY was one of those great men whose work fructifies in so many directions, fundamentally or in detail, that there is always some new tree—or may be forest, some new flower—or may be garden, owing its existence to the seed sown by him.

Sir GEORGE NEWMAN sets out in convincing manner the derivation from HARVEY'S work of many of the preventive measures which are the feature of modern medicine. He divides his address into two parts, consecutive and interdependent, but distinctly two. In the first part he has reviewed, omitting the familiar biography, the position in which scientific medicine stood when HARVEY made his discovery, and once again he shows how alive the science of medicine had been from

the dawn of history, and at the same time how hopelessly hampered it had been by the acceptation of theories that were natural, as they had their origin in physiological ignorance. But the classical teaching, coming down through Hippocrates and Galen, was never challenged, and that is an amazing fact, for the power of prestige has never been more forcibly illustrated. Much fine anatomical research and sound clinical observation was constantly forthcoming, but they never stimulated revolt from the accepted learning; all additions were fitted into fallacious premises, while theories degenerated into fancies as new discoveries required explanation on the old basis. This was the position of medical knowledge in which HARVEY found himself in the seventeenth century, heavily handicapped by ancient tradition, restricted by current knowledge, and unable, for lack of data, to explain the ultimate intention of the design which he revealed. "Nor," says the Orator, "could he complete his work, any more than any other explorer, for it was not a summary of existing knowledge from previous records, but an experimental stage in the development of a high argument." And that is why HARVEY's work always supplies a living text for comment and a living lesson for our instruction. His discovery was a step in an argument, which we to-day are following up. When the great discovery was made the mysteries of disease began to disappear at a geometrical rate of progression, and the story of progress is soundly grouped by Sir GEORGE NEWMAN under three headings: first, the recognition of a constant and stable internal environment for the regulation of health; secondly, the discovery of the cause and the methods of control in many infective diseases; and, thirdly, the establishment of the doctrines of immunity, with their promises of prevention, and their great performances. These are the steps which have been taken in the argument since HARVEY's day, grand steps, and each one opens up ways to further wisdom.

The second part of the Oration describes the intimate share which the Royal College of Physicians of London, HARVEY'S college, has taken during the past 300 years in the promotion of preventive medicine. The public services enumerated as attributable to the College are of the first order. Before the General Medical Council took over the preparation of the British Pharmacopœia to do so was the responsibility of the College, laid upon them by their original constitution over a century before HARVEY'S discovery. From 1518 to 1858 the official armamentarium of the physician was in the hands of the College. At the latter date the General Medical Council obtained the authorisation of a British pharmacopœia, but by that time the College had supervised the inventory of drugs and turned it from a medley of fanciful remedies, consonant with pre-HARVEY therapeutics, into a valuable compilation. More directly important to preventive medicine than the maintenance of a sound pharmacopœia is the orderly nomenclature of diseases as a necessary accompaniment of the registration of deaths. Here it deserved to be recorded that it was largely due to the public-spirited work of the Royal College of Physicians that the Registrar-General's reports have become the foundation of the best applications of preventive medicine. For other activities of the College having a close association with preventive medicine we refer readers to Sir GEORGE NEWMAN'S words; they prove that "undoubtedly HARVEY'S College has played a part in national therapeutics which illustrates signally the supreme value of his discovery."

THE M.O.H. TELLS THE PUBLIC

EVERY medical officer of health reports year by year to the mayor, aldermen, and councillors of the city or borough, or to the chairman of the county council, by which he is appointed. His report covers a wide range of subjects, for he is the pooh-bah of public medicine, often being responsible, in addition to the general health services, for school medical inspection, maternity and child welfare, the control of tuberculosis and venereal diseases; moreover, he may be superintendent of the fever and maternity hospitals, chief administrative medical officer to the public assistance committee, and, it may be, borough meteorologist. Further, his report may include that of the public analyst and of the inspector of factories and workshops.

Nevertheless, it is not quite clear whether the report that he makes is accessible or not to the public. The Minister of Health certainly gives advice as to its form, but he has stated publicly that there are no regulations about publication, and he did not reply directly to an inquiry in Parliament [1] whether members of the public had a right to see it on demand. There have been cases, we are told, where the report of a medical officer of health to his sanitary committee has been held up at that stage and not allowed to go any further owing to its critical character. In some towns the practice prevails of sending a copy of the report to the public library, but this is apparently an act of grace on the part of the medical officer of health, whose attitude varies over the country probably as much as the size and format of his report—a want of symmetry which is the despair of the tidy librarian. One medical officer has recently stated that it is no business of the press to announce whether there are or are not cases of typhoid fever in his borough, somewhat to the surprise of the local journal. In Scotland they do these things rather differently, for ten years ago the Scottish Board of Health suggested [2] that arrangements should be made for judicious local distribution of reports as soon as they are available, and steps taken through the local press and otherwise to bring their contents effectively to the knowledge of the people "as a means of educating the citizens in the more important conditions of public health, of warning them against particular dangers, and

[1] See THE LANCET, 1931, ii., 1385.
[2] Ibid., 1923, i., 47.

of securing that important coöperation and confidence between them and the health authorities and its staff which is essential to successful health administration." What is officially done in Scotland is no doubt the unofficial practice in many parts of England and Wales, where the reports are discussed at some detail by the local press. Probably every medical practitioner in the area gets a copy and public utility societies, interested in housing and the like, would no doubt be similarly obliged. The medical officer of health also has another way of reaching the local public through the circulation of *Better Health*, issued by the Society of M.O.H.'s, to which he is entitled to add pages of local interest.

Quite recently an interesting attempt is being made to popularise the public health services of local authorities by means of attractive little booklets issued by the council and written, or revised and approved, by the medical officer of health. Such booklets are already in circulation at Bath, Ealing, Ramsgate, and Torquay, and we understand that similar booklets are in preparation for Aberdeen, Belfast, Birkenhead, Kingston-on-Thames, and Wallasey. They are published for the public health department by Messrs. ED. J. BURROW and Co. (Cheltenham and London), to whom credit is due for their attractive form and get-up. Each report contains a directory of public health services in the area, a time-table of infant welfare centres, school medical department, tuberculosis and V.D. clinics, with useful addresses such as those of registrars of births and deaths, relieving officer, public vaccinators, and so on. Emphasis is laid in each on the fact that the public health department is open every day of the week and on Saturday morning to give advice on health matters, or to receive complaints of nuisances, and the statement occurs repeatedly that "no resident need live under insanitary conditions which can be remedied by law." There is also a recurring injunction to the public to raise the standard of care in the distribution of foodstuffs by patronising only those tradesmen who exercise care in handling them. No report emphasises perhaps as much as it might do the accessibility of the medical officer of health compared with that of other municipal officers; it is incomparably easier to get into the presence of the competent sanitary authority than it is of the borough engineer or town clerk. And this is as it should be, although at times it may lead to embarrassment of the health department.

ANNOTATIONS

ANOTHER YEAR OF RADIUM

WE learn from the reports published this week [1] that there is rather less national radium on loan than was expected when last year's allocation was made. This is due to the fact that certain centres, like the Mount Vernon Hospital and the Edinburgh Royal Infirmary, have not qualified for their full complement, although other centres, such as Sheffield and Manchester, have applied for additional loans. The amount of radium now on loan is as follows:—

	grammes.
National Radium Centres	14·655
Regional Radium Centres	0·768
Medical Research Council	1·000
National Physical Laboratory	0·186

the total being 16·609 g., a further 2·482 g. being allocated but not yet distributed. During the year £23,208 has been spent on the purchase of radium and containers, the total value of these now in the Trust's hands being estimated at £217,937. Responsibility for this, described as "the most costly substance known to man," rests heavily on the Commission, which has hitherto been able to obtain a specially low rate of premium owing to the faithful observation of very strict precautions. During the year however breaches of regulations at Liverpool, Edinburgh, and Glasgow have resulted in loss or damage to national radium which may lead to removal, at the discretion of the Commission, of any centre from the list of those privileged to enjoy such low rates. Unfortunately, owing to the rise in the market price of radium, the insured value and the amounts of premium have had to be raised by one-third. On the other hand, as there is now enough radium on loan to provide income to cover the Commission's overhead charges, it has been found practicable to reduce the rate of rental of radium from 2 to 1½ per cent.

[1] Third Annual Reports of the National Radium Trust and Radium Commission, 1931–32. London: H.M. Stationery Office. Cmd. 4173. Pp. 43. 9d.

The work of the Commission during the year has been concentrated on developing the national and regional centres. Five regional centres have been set up at Nottingham, Norwich, Southampton, Plymouth, and Stoke-on-Trent, to the last two of which a supply of radium has already been delivered. Nearly all the centres have accepted the three cardinal principles laid down by the Commission: (1) the appointment of a specially trained radium officer; (2) the proper coördination of ancillary services; and (3) the acceptance of patients for radium treatment from other hospitals in the area whether voluntary or rate-aided. The Commission reiterates that the principle of concentration implies no lack of sympathy with hospitals not selected as national centres; these it is hoped will coöperate in the task of advancing our knowledge of radium therapy by adopting the approved forms of clinical record and thus providing material for statistical purposes. The voluntary hospitals are pointedly reminded in the report that national radium is available to all patients for whom it is required, even if they are able to meet the full charges of the hospitals to which they are admitted; 80 per cent. however of radium beds must be reserved for the service of ordinary patients whether in the care of voluntary hospitals or of those administered by local authorities. The Commission deprecates any tendency to concentrate upon effecting cures in the more favourable cases to the detriment of a wider effort to relieve suffering in advanced cases which is an important function of radium therapy. The post-graduate centre formed by the liaison between the Mount Vernon Hospital and the Radium Institute has not developed in the expected way and is now regarded as more likely to become a rendezvous for the systematic study of the clinical side of radiotherapy. The appointment of radium officers to the national centres has lessened the need of special technical instruction for the staff of these centres, while many students are seeking clinical information

and experience. One of the duties of the Morris Research Fellow will be to give advanced lectures upon the subjects in which he is specialising.

The work of the Institute has been broadened by the building of a new out-patient department and the addition of an electrotherapeutic department which will in the near future include facilities for deep X ray therapy. The radon supply depôt has not been quite working to capacity. The scientific problems connected with mass radiation by radium are now under examination by a special technical committee, and in the meantime the four-gramme bomb has been split into three one-gramme units allocated to the Cancer Hospital, the Middlesex Hospital, and University College Hospital, the remaining gramme being left by the King's Fund at the disposal of the Westminster Hospital. These units are being applied in a new apparatus, illustrated in the report, which can be brought to the bedside of a patient. Finally, the reports mention the receipt of the first consignments of summary cards, numbering about 1700, dealing with patients treated with national radium during the year 1930 when only about half the centres were yet in full working order.

TWO FORMS OF DIPHTHERIA BACILLUS

LAST year Anderson, Happold, McLeod, and Thomson,[1] working in Leeds, produced a paper describing two types of diphtheria bacillus, *B. diphtheriæ* "gravis" associated with severe and toxic cases, *B. diphtheriæ* "mitis" associated with milder cases of the disease. The two types were differentiated mainly by their growth characters on "tellurite chocolate agar" and by their power of fermenting certain polysaccharides, the gravis type being able to ferment starch and glycogen while the mitis type was without this power. The authors made it clear that in their opinion these observations justified a new classification of the diphtheria bacillus and might provide a solution of the much discussed problem of the alleged failure of antitoxin treatment in certain "malignant" outbreaks. It is obvious that the findings if substantiated are of great importance to clinician, bacteriologist, and serologist alike. Perhaps those most familiar with the bacteriology of diphtheria were most surprised at this claim of new discovery on such well-beaten ground. Other workers at once attempted to confirm the observation and at least three papers on the subject have already been published, the latest of which is to be found on p. 884 of this issue. The net conclusions of the three different sets of workers are in contradiction to those of Anderson and his colleagues. Menton,[2] Parish, Whately, and O'Brien,[3] and Wright and Rankin seem to agree that of the differential characters described by the Leeds workers only starch and glycogen fermentation could be relied on as sharp and objective. None of them could find any support for the view that the fermenting strains were any more clinically virulent than the non-fermentors. Parish, Whately, and O'Brien gave special attention to the serological aspects of the problem. They found that gravis and mitis forms were indistinguishable in animal virulence, and, as might have been expected, that animals immunised against the "Park-Williams" strain were completely protected against gravis strains. In therapeutic experiments on rabbits and guinea-pigs no difference could be recognised in the curative value of ordinary antitoxin for the two types. They also made the surprising observation that the gravis strains were consistently poorer producers of toxin in vitro than the mitis strains.

It is obvious from the work of Anderson and his colleagues that some virulent diphtheria bacilli ferment starch and glycogen while others do not; but so far, except in the Leeds observations, no connexion has been shown between this character and the clinical severity of the disease. A possible, though perhaps improbable, explanation of the Leeds findings is that a single "epidemic" strain of the bacillus with gravis properties was responsible for the bulk of the severe cases met with. Only a thorough study of the strains from the point of view of agglutination serology is likely to clear up this point, and it may be mentioned that special difficulties have been met with in the technique of agglutinating tests for the gravis strains, presumably owing to their tendency to form unstable suspensions. It would be premature to pass final judgment at the present moment on a question which, once raised, will have to be pursued to a final solution, but the claim of the Leeds workers to have established their main thesis can obviously not yet be allowed. The nature of "malignant" and "antitoxin-resisting" outbreaks of diphtheria still remains somewhat obscure, but there is little doubt that many if not all such outbreaks can be referred to late or inadequate antitoxin treatment rather than to any essential failure of ordinary antitoxin to act as a specific remedy.

[1] Jour. Path. and Bact., 1931, xxxiv., 667.
[2] Ibid., 1932, xxxv., 651. [3] Ibid., p. 653.

THE HEALTH OF ALEXANDER THE GREAT

Dr. Mario Bertolotti has written a book,[1] the latest contribution to the Biblioteca di Scienze Moderne, upon the physical disabilities of Alexander the Great, the wounds which he sustained and the diseases through which he passed, which will obtain interested attention from all students of medical history; when it is considered what the great conqueror suffered, as far as the records can be relied on, his exploits become even more wonderful than they appear in the usual chronicles. An accidental re-reading of Plutarch suggested to the author that a systematic research into the health of Alexander would shed new light on the problems of general history. While it must be left to professional historians to estimate how far this may have occurred, medical readers, who chance to know Italian, will be grateful for some capital reading. Dr. Bertolotti gives authorities for his facts, and has diligently studied the numerous references to Alexander made by a multitude of authors. While he draws his own deductions he makes no violent claims for their originality, and often points to other writers as having made similar reflections previously. The message of this useful historical note is that too little stress has been laid hitherto upon the health of the protagonists by those who reflect on and describe the events of history. Certainly the course of civilisation might have been altered radically in many instances if the physical make-up of the captains and kings had been different, and this should be considered in the estimates of what they did and for what their performances counted. Alexander the Great appears to have had some torticollis and facial asymmetry, despite his personal beauty. It seems that he fractured the base of his skull as a youth, had a penetrating wound of the thorax followed by an empyema, while his life was shortened by malaria. He came to the throne of Macedonia

[1] Alessandro Magno. By M. Bertolotti. Turin: Bocca Fratelli. Pp. 416. 56 lire.

when he was 21, and died in his thirty-third year, having in 12 years established an empire over the world east of Greece, as far as it was known. The splendour of his conquests was dimmed by his outrageous passions, and it is the merit of this book to show how much his physical sufferings must have contributed to his moral defaults. His early death, following on his injuries and diseases, contributed to the collapse of his huge endeavours; if he had lived to hold the reins longer, a consolidated empire might have arisen in the early centres of civilisation, to the radical alteration of the world's history.

CARBOHYDRATE METABOLISM IN TOXIC GOITRE

IT is generally accepted that glycosuria may occur in toxic goitre, but its incidence has been variously estimated at from 1 to over 90 per cent. The discrepancy may be found in the differing technique and care with which the sugar is sought. By examining separately all portions of urine passed over a period of one to two weeks, W. T. Anderson has demonstrated [1] glycosuria at some time in every one of 25 cases, all of which gave a diabetic type of curve with the glucose-tolerance test—that is to say, a curve higher and more protracted than in healthy controls. Using a less delicate technique, H. J. John has found [2] persistent hyperglycæmia in only 2 per cent. of toxic goitres, but this is still twice the incidence of diabetes in the general population. He points out, moreover, that no sugar-tolerance curve is specific in this condition, and that there is no strict relation between the severity of the thyroid disorder and the impairment of sugar tolerance. Among 9000 cases hyperglycæmia was present in 620; after thyroidectomy, and dietetic treatment with or without insulin, the sugar curve in the majority became normal in a few months, but in 200, or about 2 per cent. of the whole series, hyperglycæmia remained. In another series of cases he found that the reaction to ingested carbohydrate was of diabetic type in two-thirds, the renal threshold being low in the majority. John believes the disturbed carbohydrate metabolism in toxic goitre to be due not solely to the thyroid but to a predisposition to diabetes, or to a diminished reserve of the insulinogenic apparatus. The increase in the metabolic rate which accompanies the thyroid disorder puts an increased load on this apparatus, which becomes exhausted, diabetes resulting. In these cases glucose administration before and after operation, with or without insulin, is a logical procedure. Post-operative examinations will be necessary until there is satisfactory evidence that the carbohydrate metabolism has returned to normal. In most this will take place within a few months, but in others a mild dietary routine must be continued, with insulin in addition when indicated. The case described by Dr. A. W. Hendry in our present issue must be of rather exceptional nature. He describes a young woman with exophthalmic goitre accompanied by moderately severe diabetes, in whom treatment with insulin and diet over a period of six years resulted in a considerable gain in weight and disappearance of all signs of thyroid toxicity. Yet the diabetic state as judged by the blood-sugar level and the presence of ketosis was not improved in spite of increasing doses of insulin. After the administration, however, of a small daily dose of thyroid extract a striking change occurred—viz., frequent hypoglycæmic attacks, which necessitated a large reduction of the insulin dose. The diet was then increased, the urine remaining sugar- and acetone-free. Here, contrary to the usual experience, thyroid extract seems to have caused a sudden increase in sugar tolerance. Evidently there are interactions between the thyroid and the pancreas and their products which are still imperfectly understood.

[1] Acta Med. Scandinavica, 1932, lxxviii., 229.
[2] Jour. Amer. Med. Assoc., August 29th, p. 620.

THE CONGRESS ON RHEUMATISM

THE third International Congress on Rheumatism was held in Paris at the end of last week and was largely attended, the representatives of foreign governments and rheumatism committees including Sir Humphry Rolleston and Sir William Willcox (Great Britain), Dr. A. M. McIntosh (Scottish Health Department), Dr. G. Kahlmeter (Sweden), Prof. B. Prusik (Czechoslovakia), Prof. S. Pisani (Italy), Prof. M. Kontchalowski (Russia), Dr. F. Kornmann (Switzerland), Dr. E. Freund (Austria), Dr. L. v. B. Pap (Hungary), Prof. I. Gunzburg (Belgium), and Dr. J. van Breemen (Holland). Prof. Fernand Bezançon, chairman of the French Committee on Rheumatism, presided, with Dr. Mathieu-Pierre Weil as secretary. The French Minister of Health opened the proceedings with a cordial speech and Sir Humphry Rolleston responded for foreign governments. Dr. Fortescue Fox, on behalf of the International League against Rheumatism, noted the progress of the movement in many countries since the first international committee was set up in Paris in April, 1925. He suggested that the subject was so vast that the League might well be content to confine itself for the present to the chronic rheumatisms of adult life, and spoke of the *terra incognita* of the abnormal reactions of rheumatic subjects to external impressions. At the ensuing sessions many reports were presented, on the initial symptoms of chronic rheumatism; on rheumatic diseases and tuberculosis, in which divergence of opinion was evident; and on rheumatic diseases and occupation. The last included interesting communications from Russia (Dr. Danischewski) and Sweden (Dr. Kahlmeter), while Dr. Vincent Coates (Bath) presented a statistical return of occupation in 18,000 cases at the three chief British spa hospitals. The President and Dr. Weil showed many cases illustrating the various forms of arthritis including some of nervous origin, and Dr. J. B. Mennell gave a practical demonstration of the diagnosis of abnormal conditions in the sacro-iliac joints and lumbar spine which was greatly appreciated.

It was decided to hold the next Congress on Rheumatism at Moscow in September, 1934.

THE SIZE OF THE RED CELLS

IT is becoming clear that future workers, in discussing the significance of variations in the size of red cells, must consider not only the diameter of the red cell, but its volume and its hæmoglobin content. R. L. Haden [1] has lately made a valuable study of cell volume and hæmoglobin content in 444 normal and abnormal persons from which he concludes that in cases of sudden mechanical blood loss there is a change in the number of cells only, whereas with a chronic loss the cells become progressively smaller with a low hæmoglobin content.

[1] Arch. Int. Med., 1932, xlix., 1029.

When the anæmia is due to accelerated destruction the mean cell volume tends to increase, since the reticuloytes are usually larger than normal. With decreased blood formation, though the findings are variable, the mean cell volume and hæmoglobin content are seldom greater than normal except in pernicious anæmia. Megalocytosis, he believes, is seldom seen except in the latter condition. Gordon Goodhart [2] has, however, recently published a series of megalocytic anæmias which do not appear to be of the typical pernicious type. The erythroblastic anæmia associated with steatorrhœa is also megalocytic, as determined by measurement of red cell diameter. Haden's observations further lead him to conclude that iron causes an increase in stroma as well as in hæmoglobin, since iron therapy in microcytic anæmia caused an increase in the volume of packed cells as well as of hæmoglobin. This is in accord with C. Price-Jones's [3] observations when determinations of red cell diameter as opposed to cell volume were made. He found that treatment with iron removed the microcytosis and reduced the variability. Further, by means of special staining, he demonstrated that the pale cells so characteristic of the condition were finally replaced by deeply stained cells presumably containing more hæmoglobin. Cell volume determinations alone fail to demonstrate any variation in the size or type of cell present in any sample giving only an average figure. Red cell diameter measurements enable an estimate of variability, both of size and cell character, to be made which are often of considerable importance. A combination of the two methods should therefore be employed whenever possible.

PREVENTIVE MEDICINE AND PUBLIC OPINION

AT the Royal Institute of Public Health on Wednesday last Sir Ernest Graham-Little delivered an address with this title in which he laid about him manfully. The neglect of Sir Ronald Ross, the inconsistency of the Medical Research Council, the extravagance of subsidising researches along particular lines, the grave expenditure on public health services out of public funds, the lowness of the national physique, the wrongful treatment of our milk-supplies, and the unwarrantable expense of dealing with mental defectives—all alike formed allegations supporting the thesis that "there is a vast waste of money and of effort in our present measures to better the health of our people." That thesis cannot be taken as proved in the general way which Sir Ernest thinks—some of the expenditure, however great, and much of the effort do not constitute waste at all. In supporting his arguments, or rather his asseverations, by quotations from others, he does not seem to be aware that he might be asserting in accordance with his thesis answers to questions on which there is much room for differences of opinion; further, he said nothing of organised efforts which are meeting with success, or of resolutions already formed by competent experts to deal with many of the evils described. It is an excellent thing that a prominent public man should arouse the public conscience; the intention not to gloss over the many unhappy situations in which we live, with their obvious detriment to public health, is commendable; but whoever does these things ought to admit that his revelations are exposing ills which are well-known to many experienced workers, and should not forget to say that scientific and statistical investigation of varied sorts is inquiring into the soundness of diverse broad recommendations for reform. In the latter part of his address Sir Ernest, Member of Parliament for a university deeply interested in the medical profession, was on more certain ground, and in his advocacy of the institution of a pass qualification in medicine, given by the State, as a remedy for examinational procedures that do not serve the purposes of the general practitioner, he was following opinions that have often been expressed. He made no allusion, however, in his address to the grave objections to the institution of two orders in the profession, one of which is hall-marked as superior to the other; while the coincident training of undergraduate and graduate students at our medical schools has difficulties which he did not mention or does not appreciate. In his address to the Institute, we credit Sir Ernest with enthusiasm but not with judgment. He may have moved some hearers to a wish, not previously felt, that the sanitary world should be set aright, but he did not give them well-balanced information.

[2] Proc. Roy. Soc. Med., 1932, xxv., 1713.
[3] Jour Path. and Bact., 1932, xxxv., 759.

AIR EMBOLISM

IT always seems astonishing that a bubble of air should be a cause of sudden death, and it was high time that this unsubstantial instrument of destruction took the fancy of a writer of detective stories. But now that the addicts have had plenty of time to enjoy Miss Dorothy Sayers's treatment of the subject it is perhaps justifiable to express doubt about the methods of the villain of the novel. Profiting by her training as a nurse in the Royal Free Hospital, this woman is in the habit of anæsthetising other characters, and injecting small quantities of air into their blood-vessels from a hypodermic syringe. The authorities, finding no evidence of a lethal agent, are helpless in face of a steadily rising death-rate, and even the medical reader may be annoyed to find himself no wiser. When the end comes, however, he may feel that fiction for once has proved itself a little stranger than truth; for it is hard to believe in the feasibility of induced air embolism as a practical method of murder.

There is no doubt, of course, that air injected into the circulation in quantities sufficient to replace a large mass of the blood in the heart chambers causes immediate failure of the circulation and instantaneous death. Some pathologists, indeed, adopt this as the most humane and least destructive method of killing their experimental animals. But in these cases the cause of death is clearly revealed by the presence of foamy blood in the heart. It is much less likely that a bubble of air small enough to escape detection could be relied upon to kill by entering the cerebral circulation and there setting up an air-lock in relation to some vital centre in the manner commonly implied by the term air embolism. This problem comes up periodically for debate, and it is at present being revived in relation to accidents in thoracic surgery. The condition described as pleural reflex, or "epilepsie ou eclampsie pleurale," consisting of sudden fatal syncope, convulsions, and hemiplegia, appearing in the course of induction of artificial pneumothorax and other thoracic operations, and hitherto considered to be something in the nature of reflex shock, is now suspected of being a manifestation of gas embolism in the brain. L. Croizier [1] has advocated this hypothesis in a lengthy discussion, wherein he also explains the mechanism by

[1] Rev. de la Tuberc., 1927, viii., 477.

which air may enter the circulation at the site of minute wounds of the lung, impelled by the negative pressure existing in the pulmonary veins during inspiration. Sergent, Baumgartner, and Kourilsky[2] have described a case in which, during an operation on the lungs, the hemiplegia and other signs were so clearly indicative of a localised cerebral lesion as to convince them that air embolism was the cause. They cite a number of authors who have had like experiences, and they mention two cases in which observers claim to have detected the site of embolism marked by foci of softening in the brain. Absolute proof that air embolism is the cause of these accidents is, of course, difficult to furnish, chiefly because the presence of gas in blood-vessels post mortem is a not uncommon result of bacterial growth in the cadaver, and therefore no criterion of the state of affairs during life. But Croizier has shown experimentally that small amounts of air injected directly into the carotids of animals can produce manifestations corresponding to those observed in the cases mentioned, and there is little reason to doubt that such accidents as air embolism can occur in man. That they must be rare was shown by M. Joannides and G. D. Tsoulos,[3] who demonstrated that dogs were able to withstand as much as 300 c.cm. of air injected into their femoral veins provided the injection was given slowly (over a period of 30–40 minutes). Probably, therefore, the number of fatal accidents of this kind is exceedingly small in comparison with the number of cases in which air finds its way into the circulation.

BIRTH CONTROL AND EXTRA-UTERINE GESTATION

AN attempt to correlate the increased incidence of extra-uterine gestation in Switzerland with the extension of the practice of conception control and criminal abortion has recently been made by Hans Guggisberg.[4] Attempts to prevent conception by the introduction of intra-uterine stems or silver rings, such as that of Gräfenberg, are by no means always successful. He quotes H. Gummert's report[5] of 92 cases in which pregnancy occurred after use of one or other of these methods, 78 of these pregnancies ending in abortion, usually septic. Guggisberg holds that tubes or rings often give rise ultimately to tubal pregnancy, because of the permanent changes set up in the tube following inflammatory complications. He deprecates also contraceptive methods involving the use of vaginal occlusive pessaries, which in his experience may lead to sepsis by causing retention of secretions. Attempts at criminal abortion are not infrequently made in patients who have tubal pregnancy with disastrous results, such as tubal rupture complicated by sepsis. Not only is the diagnosis in such cases extremely difficult, but the dangers of laparotomy are much increased. Two such cases are here related, both of which recovered after laparotomy. Guggisberg holds that the control of family regulation should be undertaken by the State, though he makes no suggestion as to the methods of regulation that the State should adopt. Kurt Kaiser,[6] writing from Silesia, is also of opinion that the increase of criminal abortion has led to a greater incidence of ectopic gestation, but much more evidence will have to be adduced before this can be accepted.

The possibility of injury being caused through the damming back of cervical secretions has been frequently discussed. This possibility especially arises in connexion with close fitting cervical caps made of metal which, in certain continental countries, are placed in position at the end of a menstrual period and left in situ until dislodged by the menstrual flow occurring at the next period. Retention of secretion is unlikely to occur when a rubber cervical cap is employed which is placed in position for short periods of not more than ten hours. It is especially improbable if the rubber cap has a high rubber dome. With this and with the so-called Dutch pessary, which roofs over the vaginal vault, fitting anteriorly above the symphysis pubis and behind in the posterior fornix, the danger is negligible, and it clearly does not arise at all when a sheath is used. The criticism adduced by Guggisberg of the use of contraceptives therefore only applies to certain types of these. In this country the Gräfenberg ring method is now generally regarded as unreliable and potentially harmful.

[2] Bull. et mém. Soc. méd. Hôp. de Paris, 1932, xlviii., 1008.
[3] Arch. of Surg., 1930, xxi., 333.
[4] Schweiz. med. Woch., 1932, lxii., 691.
[5] Monats. f. Geb. u. Gyn., 1914, xxxix., 417.
[6] Med. Klinik, 1932, xxviii., 1057.

HUMAN AND BOVINE TUBERCULOSIS

THE presidential address delivered before the Hunterian Society on Monday last by Dr. Nathan Raw, was based on his personal experience in hospital and laboratory during the last 40 years, most of the observations being made during his superintendency of the Mill Road Infirmary, Liverpool. In 1901 Koch stated, at an international conference in this country, that bovine tuberculosis could not be conveyed to man, and seven years later he repeated the statement at an international conference at Washington. Dr. Raw told how, in secret session, a group of experts—he and Sims Woodhead representing Great Britain—met Koch and persuaded him to modify his views, and the universal medical view to-day is that bovine bacillus conveyed to the human subject causes a large amount of tuberculosis. The conveyance of bovine bacilli, especially to the young by milk, formed the substance of his address; this concluded with a number of questions awaiting solution, which are enumerated in the summary of the proceedings at the meeting of the society (see p. 900).

THE Bradshaw lecture of the Royal College of Physicians of London will be given on Nov. 1st by Dr. Dugald Baird, whose subject will be the Upper Urinary Tract in Pregnancy. On Nov. 8th and 10th Dr. James Collier is to deliver the FitzPatrick lectures on the Development of Neurology from the commencement of the Nineteenth Century to the Present Time; and on the 22nd Prof. L. P. Jacks the Lloyd Roberts lecture, on the Liberal Education of the Body. All these lectures will be given at 5 P.M. in the College, Pall Mall East, and will be open to members of the medical profession on presentation of their cards.

THE study of the relationship between oxygenation of the tissues and the maintenance of good cardiovascular function during spinal anæsthesia, annotated in this column last week (p. 852), was made by Dr. M. H. Seevers and Dr. R. M. Waters, of Madison, Wisconsin. We regret the inadvertent omission of the names of the authors.

POST-GRADUATE LECTURES

We continue this week the publication of summaries of lectures lately given to post-graduates at teaching hospitals. Prof. de Wesselow spoke at St. Thomas's, Mr. Banister at Charing Cross, and Dr. Hutchison and Mr. Milne at the London Hospital.

DIABETIC COMA

(PROF. O. L. V. DE WESSELOW)

In the first place, what does coma in the diabetic imply? I think we should agree in attributing it to a lack of active insulin in the patient. In the absence of adequate insulin an inadequate amount of carbohydrate is oxidised, and with this failure to oxidise carbohydrate excessive amounts of the so-called ketone bodies are formed.

Further, in most cases it would seem that this failure of insulin-production is a temporary aggravation of an existing defect in the islands of Langerhans, rather than the last stage of a slow but steady decline in the function of these structures. We are dealing with a temporary crisis of a highly dangerous nature, but if once we can tide the patient over this phase we shall usually find that, as far as his carbohydrate tolerance is concerned, he is in much the same condition as he was before coma supervened; the ultimate outlook is relatively favourable.

What then precipitates this temporary failure in insular function? Undoubtedly in the great majority of cases the factor is infection. Anyone who is accustomed to the care of diabetics realises the disastrous effect of infection of any kind on their carbohydrate tolerance—that is, on their insulin-production. The diabetic clinic in summer is relatively uninteresting; during the winter months, with the onset of respiratory infections, a constant readjustment of insulin dosage become necessary. It is surprising how a scarcely noticed cold will lead to the reappearance of sugar in the urine.

We must aim then at shielding the diabetic from infection. Further, if the diabetic contracts an infection there must be no hesitation in increasing his insulin dosage if sugar and ketone bodies appear in the urine. In the past the risk of coma in the infected diabetic has been enormously increased by a wholly unwarranted fear of hypoglycæmic reactions. The febrile patient was unable to take his ordinary diet. Insulin was withheld for fear of reactions and coma ensued. Actually, the febrile diabetic needs more, not less, insulin; his hyperglycæmia is usually difficult to control, and, however poor his appetite, the dose of insulin can always be covered by adequate carbohydrate in the shape of glucose lemonade or bread and milk.

Now let us turn to the patient in whom coma has developed. The first point that will strike you is the hyperpnœa. This hyperpnœa which, as you know, is the result of stimulation of the respiratory centre by the altered reaction of the blood, is useful, and even essential, in that by removing excessive amounts of carbonic acid from the blood it tends to maintain the reaction of that fluid at something near its usual figure. Without hyperpnœa a change in the reaction of the blood to a level incompatible with life would soon ensue. Hyperpnœa however, when maintained over long periods, is not free from dangerous consequences. In the first place, the heat-loss in the expired air is considerable—hence the low temperature of the comatose patient. Secondly, and more important, enormous quantities of water pass off from the lungs. It is calculated that 5000 c.cm. of water per diem may be lost in this way by the comatose patient against the normal quantity of 500–1000 c.cm. The result of this loss is extreme desiccation. Even though the blood is the last tissue in the body to be affected by desiccation, the blood volume in coma may be reduced by as much as 30 per cent., while the leucocytes, red blood-cells, and proteins of the plasma show a corresponding rise. Desiccation then is one of the most important problems in the treatment of coma.

A second feature of coma is cardiac failure—a progressive increase in pulse-rate and a steady fall in the strength of the heart beat. This is understandable when we consider the strain thrown on the heart by the hyperpnœa, the increased viscosity of the blood, and the possible toxic effect of the ketone bodies. When we add to this the fact that the cardiac muscle is often damaged by a coexisting infection, and that in some diabetics coronary arteriosclerosis is present, cardiac failure is to be expected.

Lastly, it is not always realised that severe renal damage is a concomitant of diabetic coma. This fact, which was well recognised in the last century, has only again come into prominence as an explanation of some cases of failure of insulin therapy. Occasionally a patient recovers from diabetic coma only to die from uræmia. An examination of the urine in coma will usually show the presence of albumin and casts.

The main outlines of treatment are obvious. In the first place, we must inhibit further production of the ketone bodies. This we accomplish by providing enough insulin to allow adequate carbohydrate oxidation to be resumed. Secondly, the existing concentration of the ketone bodies in the tissue fluid must be reduced, and this can only be effected by the kidneys. For the kidneys to do their work ample water must be available, and the renal circulation must be intact. We have therefore to introduce fluid into the desiccated body and as far as we can to support the heart. Lastly, time is of the first importance. In view of possible cardiac and renal failure we cannot afford to temporise.

My own view is that these cases are best cared for in an institution, provided that their removal does not entail a delay of more than an hour or two in commencing intensive treatment. Before transport an injection of insulin should of course be given. Many cases, however, must of necessity be treated in their own homes, where blood-sugar estimations will not be possible. Your difficulty here will be to avoid hypoglycæmic coma while at the same time giving an adequate insulin dosage. This can be effected easily enough by keeping the blood-sugar high throughout the treatment. A high blood-sugar is harmless. It is the excess of ketone bodies in the blood which constitutes the danger. For treatment you will need insulin, glucose, an infusion set, some Fehling's solution, and a 10 per cent. solution of ferric chloride. A nurse is essential for the general care of the patient, to force fluids as soon as swallowing becomes possible, and for the collection and labelling of all specimens of urine passed. As long as glycosuria is present the patient is not hypoglycæmic. The urine will therefore give you warning of the possible presence of hypoglycæmia, and by testing with ferric chloride you can follow the reduction of the ketonæmia. In a deeply comatose patient it is advisable to start

treatment with 1 to 1½ pints of normal saline containing 5 per cent. glucose given intravenously. To this 100 units of insulin should be added. The infusion should be given slowly, at least 30 minutes being taken over the process. Thereafter I should advise you to see the patient at least every three hours until you are satisfied that recovery is well started. The indications of improvement which you should look for are diminution in the hyperpnœa, strengthening and slowing of the pulse, recovery of consciousness, and diminution of the ferric chloride reaction in the urine. The further course of treatment must depend on your findings. If improved, another 20 units of insulin covered by 50 g. of glucose every three hours for the next 12 hours will probably suffice to carry the patient on. In severe cases larger doses of insulin, given intravenously, if there are indications of failing circulation, are needed. As long as you cover your insulin by glucose, introduced orally, subcutaneously, or intravenously, and take the precaution of satisfying yourself that glycosuria is present, the risk of hypoglycæmia need not worry you. Adequate insulin and adequate fluid are the two great essentials of treatment.

CHRONIC DIARRHŒA

(DR. ROBERT HUTCHISON)

CHRONIC diarrhœa is a symptom and not a disease, and diagnosis has usually to be made by exclusion. Some form of classification is therefore necessary, and the following is suggested :—

1. *Gastrogenous*, due to achlorhydria or to achylia. Why these sometimes lead to diarrhœa is not understood ; it is apparently not a question of "gastric hurry" nor of the absence of the antiseptic action of normal gastric juice. The stools are loose, and may occur either after meals or between them ; they contain undigested connective tissue.

2. *Fatty*, where the stools contain undigested fat. This variety includes the rare condition *congenital steatorrhœa*, in which liquid fat is present ; *pancreatic diarrhœa*, due to failure of pancreatic secretion to enter the bowel and in which split fat is present in excess, as well as undigested muscle-fibres ; *cœliac disease*, met with in children and occasionally in adults, and due apparently to a failure of absorption of fats ; and, lastly, rare cases in which *blocking of lacteals*—e.g., in tabes mesenterica—also interferes with fat absorption.

3. *Enteritis*, a catarrh of the small intestine which may arise from various causes—e.g., alcoholism, tuberculosis, and uræmia (eliminative diarrhœa)—but sometimes from unknown causes. The stools are fluid, and contain bile-stained mucus on microscopical examination. They may be offensive from decomposition of proteins (putrefactive diarrhœa), or sour and bubbling from fermentation of carbohydrates (fermentative diarrhœa).

4. *Colonic*.—In this large group the seat of the trouble is in the colon. One may distinguish the following varieties : (*a*) *catarrhal*—a simple catarrh of the bowel—in which the motions tend to occur in the early part of the day (morning diarrhœa) ; (*b*) *ulcerative*, due to ulcers in the colon. These may be either dysenteric or non-dysenteric (ulcerative colitis) ; (*c*) *obstructive*, where the diarrhœa occurs as an "overflow." The obstruction may be due simply to an accumulation of scybala (spurious diarrhœa) or to non-malignant—e.g., tuberculous—or, far more commonly, malignant tumours.

In all cases of chronic diarrhœa the stools are apt to contain visible mucus, and, if ulceration is present, blood. Tenesmus is also frequent. The general nutrition, however, suffers less than in cases of enteritis.

5. *Neurogenic*, where the nerve mechanism is alone at fault. One may distinguish as varieties : (*a*) *reflex*, an exaggerated reflex excitability of the bowel. If the motions occur immediately on the taking of food the diarrhœa is spoken of as *lienteric* ; (*b*) *emotional* or *psychogenic*, where fear, anxiety, and other emotional states "fire off" the bowel.

DIAGNOSIS AND TREATMENT

The differential *diagnosis* of these varieties involves the taking of a careful history ; thorough physical examination, both abdominal and general ; an inspection of the stools, both by the naked eye and the microscope ; and a digital exploration of the rectum. In some cases it may also be necessary to use the sigmoidoscope ; to give a test-meal, and to have a chemical analysis of the motions for fat, &c. An X ray examination after a barium enema is often helpful. In spite, however, of the most careful investigation the cause of the diarrhœa frequently remains unexplained.

Treatment depends upon the cause, and the routine use of astringents is to be avoided. *Diet* is of the first importance, but over-strict dieting is harmful. As a general rule, a low-residue diet is to be chosen, but it must be modified in special cases. Thus, in gastrogenic and in putrefactive diarrhœa meat must be restricted ; and in the fatty group, fats ; in the fermentative, carbohydrates. *Drugs* are of limited value, but hydrochloric acid is a specific in the gastrogenous group, moderate doses usually sufficing. Calcium carbonate and phosphate are of use in enteritis, especially in the fermentative form, whilst bromides often control neurogenic diarrhœa. Opium should be used sparingly, and chiefly for pain and tenesmus. As a means of "locking up" the bowel in the psychogenic cases it is liable to abuse, but is of great help in small doses before meals in the lienteric type. Emetine should be given in the dysenteric group of amœbic origin, and castor oil in "spurious" diarrhœa. Pancreatic preparations are indicated when unsplit fat is present in the motions in excess. *Lavage* of the bowel can easily be overdone, but is helpful to a limited extent in simple ulcerative colitis, normal saline being probably as useful as astringents. *Vaccines* are generally useless. *Surgical* intervention is the only treatment in malignant and tuberculous obstructive diarrhœa. It is also called for in some cases of ulcerative colitis, ileostomy or cæcostomy being the operations of choice.

UTERINE INERTIA

(MR. BRIGHT BANISTER)

THE subject of uterine inertia is not presented to students in a satisfactory way. Inertia is the property of matter whereby it retains its state of rest or movement in a linear direction unless some outside cause appears to alter it, but the term is commonly used to describe a motionless body. The classical derivation, however, means "without skill," and in considering uterine inertia we are considering why the uterus is acting without skill, not why it is failing to act at all.

It is misleading to talk of primary and secondary uterine inertia, for the two types are diametrically opposed, and are not two phases of the same condition. In the so-called primary type uterine action is sluggish and irregular from the outset of labour, while in the secondary type the uterus is exhausted after having done its best. Treatment in the first type aims at improving the action of the uterus ; in the second

type rest is the only treatment which is of value, and any attempt to make the uterus empty itself is dangerous.

Many factors may be involved in the production of disorderly action of the uterus, as found in the first type. It may result from some mechanical abnormality of the baby; in cases of occipito-posterior presentation, for example, the uterus seldom acts quite as it should. The contractions are short and painful during the first stage and are felt in front instead of at the back as a rule. Early rupture of the membranes and breech presentations may also produce irregular uterine action. The attendant should concentrate on treating the abnormality, not the uterus.

A second cause of disorderly action is muscular inefficiency of the uterus. This may be called true uterine inertia. There are poor, short, not very uncomfortable contractions, and labour may go on as long as 36 hours without the patient being at all exhausted or troubled. This type of case is usually overtreated; it is better to leave the sluggish uterus alone. Incoördinate action of the uterine muscle is a third cause. Nowadays it is unfashionable to talk of uterine polarity, and many obstetricians refuse to accept the idea of a preliminary relaxation of the cervical muscle. Nevertheless, there are some cases in which this relaxation fails to occur, and in which the upper part of the uterus is doing its best while the lower part resists. Rigidity of the cervix is not a good name for this condition, which is really incoördinate action of the uterine muscle. A fourth cause of irregular action takes origin from the higher centres and arises as a result of fear. The action of adrenaline upon excised uterine muscle is to stop or diminish contractions, and the same effect is obtained if adrenaline is injected during labour. When the patient is frightened large quantities of adrenaline are thrown into the circulation.

In a fifth and final type, uterine inefficiency depends not so much on poor uterine action as on a defensive contraction of the voluntary muscles with each pain. This also occurs in frightened patients. Labour usually progresses normally until the pains begin to get stronger, and then progress is retarded. The patient contracts all the muscles of her body with each pain, as though trying to put off the moment of delivery. In these patients miraculous results follow the use of some form of anæsthesia.

In one case of the kind the patient had had one previous child by breech presentation. During her second labour, her husband was continually popping in and out of the room and remarking: "I hope to God it's going to be a boy." He asked his wife repeatedly and minutely how she felt. The nurse, on the other hand, kept saying: "I do hope your baby's all right." When the membranes ruptured the fluid was brownish, and the nurse exclaimed: "There now, look at that! I must ring up the doctor at once." By this time the patient was in terror lest she was going to have a dead baby, and subconsciously she was doing all she could to postpone delivery by contracting up her muscles. At the end of three hours she was extremely tired, and chloroform was started, being given in small doses. Within 20 minutes—as soon, in fact, as the voluntary muscles were relaxed—the living child was born.

The recognition of the various types of uterine inertia begins with antenatal care. Not only the mechanical conditions present but the patient's general health must be considered. It is worth while trying to find out what the patient is feeling about her confinement, but she is often reserved and at first sight she does not appear to be worried. Complete vaginal examination should be delayed until the last fortnight of pregnancy; a vaginal examination is no part of antenatal care during the first half of pregnancy, and those who make one should have a definite reason. At an examination made during the last week or two of pregnancy it is possible to recognise those cases which are going to have disorderly action owing to resistance of the lower part of the uterus. If the vagina is not well lubricated, if the vaginal walls do not readily admit the examining finger and the patient experiences discomfort, there is likely to be difficulty in labour, more especially if the cervix feels as though it has a core of solid rubber.

During labour itself the attendant should be able to distinguish between delay due to muscular incoördination and delay due to nervous inhibition of pains. The patient in whom the musculature is not equal to its job may be in labour for a long time without suffering much. She is able to potter about the room, and is untroubled about herself; if she is given a hot bath and an enema the uterus is often stimulated into action, and she does well. The patient of the second type has short, sharp, irregular pains without much progress being made. She wants to go to bed. If this type of patient is given enemas and baths her fear will be stimulated and no good will be done. When the patient is obsessed with fear, and is showing a defensive contraction of all her muscles at every pain, some method akin to twilight sleep gives excellent results. But the action of the drug used must be supported by a tranquil environment—by pulling down the blinds and by keeping people out of the room. In the late stage of labour, chloroform anæsthesia combined with an injection of pituitrin can be given, but must be used carefully. Chloral, given earlier, is likely to have one of two types of action. After a dose of grs. 30, one patient will go to sleep for some hours and then wake and do well; another will suddenly deliver herself in about 20 minutes, the reason being, of course, that the first woman is of the flaccid type who needs rest, while the second has spasm of some part of the uterine muscle which is relaxed by the drug. The uterus is at last able to do its best, and out comes the baby. Our attitude to our patients should reflect that of King Henry towards his soldiers before the battle, and, slightly modified, the lines might run:

> "O God of battles! Steel my *patients'* hearts;
> Possess them not with fear; take from them now
> The sense of reckoning, if the opposed *hours*
> Pluck their hearts from them."

THE UNDEPENDABLE KNEE

(MR. ROBERT MILNE)

FOR the patient, a knee has not recovered from an injury until he feels he can depend upon it. The knee should be capable of extending until the leg is straight and bending until the calf touches the hamstrings. There should be no lateral movement when the knee is straight, but when the knee is bent it should be possible to rotate the tibia slightly on the femur. When the legs are straight, moreover, there should be no difference between the quadriceps muscles on the two sides. The quadriceps is the most important factor in making a knee stable.

Since the advent of the camera and the cinematograph it has become possible to analyse the mechanism of walking. When the right foot is on the ground and the left foot in the act of passing it, the right knee is seen to be, not straight, but slightly bent. It only straightens when the left foot reaches the ground and it becomes necessary to push off with the right foot to give the body its forward impetus. The angle which the foremost knee makes in walking is about 165°; if there was no muscular action to maintain this angle the knee would collapse. Text-books of anatomy state that the purpose of the quadriceps is to straighten the knee, and though it is true that it

had this action in rowing or walking upstairs, the chief function of the quadriceps is to prevent the knee from bending too much in walking.

It is the tone of a muscle which is the important factor; tone does not depend on the motor nerves, but possibly on the sympathetic system, and it can be maintained for hours with very little metabolic activity in the muscle. With the adoption of the upright posture the tone of muscles had to be employed to prevent the knees, spine, and arches of the feet from collapsing, and the postural activity of the whole of the human body depends upon it. When a patient sprains his knee the quadriceps wastes, and if, when the joint itself has recovered, he is left with deficient action of the quadriceps, that knee will be undependable and will let him down. It is true that patients who have suffered from infantile paralysis may learn to walk well with a wasted quadriceps, but they do it by developing certain tricks of gait—by leaning forward on a stiff knee in walking—and not by walking normally. Transplantation of muscles is seldom performed now because it has proved to be unsatisfactory. You may transplant the hamstrings to the lateral sides of the patella, but the patient is not grateful, for though he may be able to perform certain movements voluntarily from the functional point of view he is in statu quo. He can get the transplanted muscles to take on the voluntary functions of the quadriceps but they will never take on the function of tone which is essential to the dependable knee. If both knees are injured and the posterior nerve-roots supplying them are divided on one side, the knee will waste on the side on which the nerves are undivided while the knee on the other side will not. There must, then, be a reflex mechanism which is responsible for wasting; possibly this is Nature's way of putting an injured joint at rest. Even if the injury is put right the knee will not recover from the patient's point of view until the quadriceps has recovered its normal size and tone.

When trying to re-develop the quadriceps we must begin by improving the general health, because the strength of the nerve impulses reaching a muscle depends on the general condition of the patient. Massage is an expensive luxury and cannot replace active use of a muscle in the restoration of function. Swedish exercises will not serve to develop tone; this can be achieved by exercises on the lines of operatic dancing—a posture being first assumed and then maintained for a time. We cannot educate a muscle any more than we can educate a liver or a bone, but we can educate the nervous mechanism on which its activity depends and the first thing to do after curing any disability of the knee is to make sure that the quadriceps is equal to that on the other leg.

A common form of trouble in the knee is due to injury of a semilunar cartilage. Often the original injury is trivial—simply a split or a tear of the anterior end of the internal cartilage associated with little pain and no bleeding. But the broken strip may not heal up; it forms a flap which, at a second accident, gets wedged between the tibia and the condyle of the femur; the internal lateral ligament suffers strain and there is considerable pain. Before operation is undertaken for this condition, however, five indications should be present:—

1. There should have been more than one attack.
2. A history of swelling must have been obtained. If there has been nipping of a portion of cartilage the patient will not have escaped without some synovitis.
3. The internal lateral ligament will have been stretched and there will be some lateral movement of the knee when the leg is straight.
4. One thigh will be smaller than the other.
5. The presence of a loose body in the joint must be excluded by X ray examination, as such bodies can be responsible for the same symptoms as an injured cartilage; and removal of the cartilage will not help the patient with a loose body in the joint.

The patient with an injury to an external cartilage has different symptoms. Nipping, locking, and synovitis do not occur, but he feels a scrunch as he extends the knee. If the examiner bends up the knee and rotates the tibia on the femur he will get a scrunch as the cartilage passes over the external condyle. The symptom may be disquieting to a patient who is a professional footballer, but he may be assured that his knee will not let him down in front of a bus.

Paget thought that loose bodies in joints were sequestra, but sequestra are dead, and loose bodies are living fragments of cartilage, possibly with a flake of bone attached, which continue to be nourished by the synovial fluid and to grow. They give signs, symptoms, and history similar to those obtained in cases of injury to a semilunar cartilage, but they are demonstrable by X ray.

A condition which calls for treatment may arise in growing girls as the pelvis gets wider. There may be some genu valgum, and when the quadriceps contracts there is a tendency for the patella to go outwards instead of remaining in its groove. In a bad case it will go right out, but in a moderate case it may become perched on the external condyle. The knee suddenly becomes fixed and cannot be extended, but if the knee is lifted forward the patella clicks back and an effusion into the joint follows; the history, therefore, resembles that of injury to a cartilage. The diagnosis is made by straightening the leg and pushing the unusually loose patella outwards; the knee is then flexed and the patella becomes perched on the condyle. The patient will recognise the pain as being the same as that she experiences when the knee "goes out." The patella can be fitted with a spring and pad to keep it in position and in most cases the condition recovers spontaneously as the patient grows.

In some patients there are bony excrescences round the upper end of the tibia and the lower end of the femur. These may give rise to a sudden snap similar to that observed in cases of nipped cartilage, followed by pain; there will be no effusion into the joint. The differential diagnosis can be made by the absence of swelling and by X ray examination.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. S. Austin is placed on the retd. list, with the rank of Surg. Capt.

Surg. Lt.-Comdr. G. G. Newman to be Surg. Comdr.

Surg. Lt. (D) W. C. G. Ford to be Surg. Lt.-Comdr. (D).

T. F. Miles to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. R. L. Stubbs to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS

Lt. S. W. Gabbe (temp. commn.) to be Capt.

M. J. Kohane, from a temp. commn., to be Lt. (on prob.).

TERRITORIAL ARMY

Capt. A. Topping to be Maj.

Supernumerary for service with O.T.C.—Lt. H. H. Kenshole to be Capt. T. H. Wilson (late Offr. Cadet Staff Serjt., Univ. of Lond. Contgt., Sen Div., O.T.C.) to be Lt. supern. for serv. with Univ. of Lond. Contgt., Med. Unit, Sen. Div., O.T.C.

INDIAN MEDICAL SERVICE

R. D. MacRae to be Lt. (on prob.).

Lt. D. L. Trant resigns his commn.

The undermentioned officers relinquish their temp. commns.: Capts. G. L. Puri, D. R. Malhotra, and B. K. Pal.

SPECIAL ARTICLES

MEDICINE AND THE LAW

Professional Secrecy

SOME account was given in THE LANCET last week of the extent to which the law appears to expect a medical practitioner to disclose information which immemorial professional tradition regards as confidential inasmuch as the knowledge has been revealed by a patient in the course of medical treatment. Mention was made of the carefully framed resolutions of the Royal College of Physicians of London concerning the duties of medical practitioners in relation to cases of criminal abortion, published in 1916, which ran thus :—

The College is of opinion—

1. That a moral obligation rests upon every medical practitioner to respect the confidence of his patient; and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her.

2. That every medical practitioner who is convinced that criminal abortion has been practised on his patient, should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced.

3. That in the event of her refusal to make such a statement, he is under no legal obligation (so the College is advised) to take further action, but he should continue to attend the patient to the best of his ability.

4. That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation.

5. That if the patient should die he should refuse to give a certificate of the cause of death and should communicate with the coroner.

The College has been advised :—

1. That the medical practitioner is under no legal obligation either to urge the patient to make a statement, or, if she refuses to do so, to take any further action.

2. That when a patient who is dangerously ill consents to give evidence her statement may be taken in one of the following ways :—

(*a*) A magistrate may visit her to receive her deposition on oath or affirmation. Even if criminal proceedings have not already been instituted, her deposition will be admissible in evidence in the event of her death provided that reasonable written notice of the intention to take her statement was served on the accused person and he or his legal adviser had full opportunity of cross-examining.

(*b*) If the patient has an unqualified belief that she will shortly die, and only in these circumstances, her dying declaration will be admissible. Such a declaration may be made to the medical practitioner, or to any other person. It need not be in writing, and if reduced into writing it need not be signed by the patient nor witnessed by any other person, though it is desirable that both should be done, or that, if the patient is unable to sign, she should make her mark. If possible, the declaration should be in the actual words of the patient, and if questions are put, the questions and answers should both be given, but this is not essential. If the declaration cannot there and then be reduced into writing, it is desirable that the person to whom it is made should make a complete note of it as soon as possible.

It will be noted that in particular cases of doubt and difficulty the doctor is recommended to consult solicitors; those best qualified to give guidance are the legal advisers whose work specially familiarises them with problems arising in the course of medical practice and in the defence of medical practitioners.

THE QUESTION OF PRIVILEGE

The resolutions of the Royal College were evoked by a question of disclosure in criminal matters. The lay public, it seems, needs occasionally to be reminded that the principle of professional secrecy has the widest application. In the past few days the question of privilege has been discussed in respect of a chance admission to a public assistance institution. A man had been discovered in Wrotham Park with injuries to the throat and wrist; he said he had been lying there for four days. He was taken to the Wellhouse Hospital at Barnet where he remained for five weeks. He refused to give his name and, on his discharge (when the full cost of his maintenance was paid), the records described him as "unknown patient of no fixed abode." Police officers, who had questioned him in the hospital, were understood to have satisfied themselves of his identity, but it was no part of their duty to make any public announcement in this respect. The Hertfordshire public assistance committee asked the Barnet guardian's committee (the body responsible for the administration of the hospital as a poor-law institution) for further and better particulars on the ground that the hospital record was incomplete. The latter committee thereupon asked the medical superintendent, Dr. H. R. Segar, for the patient's name. Dr. Segar rightly declined to disclose the patient's secrets though all the ordinary details of the case which the county authority was entitled to know were, of course, forthcoming. The question of disclosure or non-disclosure by the medical superintendent was discussed at a meeting of the guardians' committee. The meeting was private in spite of the protests of one member who complained that the chairman was gagging them. The committee decided by 10 votes to 7 that it was not in the public interest that a doctor should violate professional confidence. This was not a case of compelling a medical witness to answer a question in a court of law. Dr. Segar, of course, has duties as an officer of the local authority. If the body which employs him took the view that his respect for professional secrecy was a breach of his duty to his employers, legal issues might arise over the possible termination of his employment. A local authority, however, which pressed matters to extremes would still have to find a medical practitioner to replace him. The Barnet guardians' committee has happily stood firm for the principle of non-disclosure. This principle is in the public interest; secrecy is not preserved for the sake of the doctor but for the sake of his patients. It does not appear that knowledge of the name of this mysterious patient is of any supreme public importance. If there is any suspicion of a criminal element in the patient's injuries, that is a matter for the police authorities and has already been investigated to their satisfaction. The sole question for the medical practitioner in the Barnet case was whether the information about the name

came to him in confidential circumstances or not. Dr. Segar was in the best position to answer this question. The answer being presumably in the affirmative, he took the only course possible.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE TRAINING OF CHILDREN'S NURSES

Prof. Charles MacNeil, whose chair is "child life and health," in addressing the Edinburgh Women Citizens' Association the other day, said that his subject included the study of the body of the healthy child and those influences which maintained it in perfect health. Was there no way by which the women could receive benefit from this study? But before one could reach the mother herself, the education of the nurse was important. What was wanted was to bring up to something like the sick-nurse's level of efficiency the training of that other kind of nurse, the nurse of the healthy baby and the healthy child. In spite of the beginning made with mother-craft schools, Norland nurses, Princess Christian nurses, and child welfare nurses, Dr. MacNeil maintained that their training is still far behind that of the sick-nurse. The training should cover the diet of babies and little children, and the standards of health of an infant from birth up to the age of 5 years. Children's nurses should also be unerring in recognition of slight deviations from those standards. This was really an extensive programme of knowledge, he said; but it was ideal work for women, and no man could do it. There were only two places where such training could be given—the maternity hospitals, to a limited extent, and the child welfare centres. Child welfare nurses had greatly improved the homes of the poor. If he had his way he would increase their numbers in ten years at least tenfold, and give them far more responsible work.

EFFECTS OF ANXIETY

Dr. James Orr, St. Andrews, speaking on worry, said that nowadays a state of anxiety was accepted as a normal attitude, and he felt that this anxiety constituted the gravest menace to the physical and moral well-being of the nation. From an experience of over 30 years in the practice of general medicine, he could affirm, without fear of serious contradiction, that it was the most potent single cause of ill-health and disease in the civilised world at the present time. Day by day, in all classes of society and in every walk of life, one saw the damage done by anxiety with its attendant worry and apprehension. And the sad thing was that it was, in the main, unnecessary and ought to be very largely preventable. Whoever attempted to evade the inevitability of his environment was laying up for himself a miserable and anxious life, whereas he who was willing to meet the problems of his environment fairly and squarely and adapt himself to them would face the vicissitudes of his life with equanimity.

WOMEN'S WORK

At a women's conference at Dunblane Dr. Margaret Martin commented on the pamphlet on women's work lately issued by the International Labour Office, saying that it was inaccurate in its information and that the inaccuracies are bound to be prejudicial to the woman worker. A great deal of the nervous strain and debility she had discovered in working-class women was due, not to the work they did, but to the worry of not knowing where the next meal was coming from; there is more sickness due to unemployment and consequent under-nourishment than to overwork.

Dr. Joan Rose, speaking of the case of the pregnant woman in industrial work, said that employment during pregnancy is really a question for the individual. If the factory conditions are good and medical supervision adequate, it should be possible to deal with individuals instead of bringing in mass legislation to say that the pregnant woman is not fit for work. Any regulations should be permissive rather than obligatory.

THE REVOLUTION IN MEDICINE

At a recent meeting of the Scottish Association of Insurance Committees Prof. E. P. Cathcart, F.R.S., pointed out that faulty nutrition was until recently largely an evil of the towns, but the advent of motor vans had brought about a deterioration of the standard in the country. More costly and often inferior bought articles were steadily replacing the sound, if less decorative, home-made article, with a resultant deterioration in the standard of cookery. In the past the public health attack had been mainly directed against material things like water-supplies, sanitation, and slums. In the future, the main attack would be, indeed must be, on the habits and customs of men. Much could be done to reduce the incidence of severe illness even now if men were periodically examined, whether ill or not, and he was a firm believer in the scheme of examination adopted by certain big insurance companies in America. The great advance of medicine in the future would, he felt certain, be the accurate recognition of the first signs of the disturbance of normality. But man was an individual, and the old adage that it was impossible to teach an old dog new tricks was physiologically true. Hope lay in the young either of this or the next generation. Yet who could devise measures to enmesh the elusive mind of the adolescent female—on whom really depended the success of such attempts?

PARIS

(FROM OUR OWN CORRESPONDENT)

THE FIRST INTERNATIONAL CONGRESS ON MEDITERRANEAN HYGIENE

THE International Congress on Mediterranean Hygiene recently held at Marseilles under the presidency of Prof. Marchoux has yielded many interesting discussions on the diseases, old and new, more or less peculiar to this area. Prof. Marchoux's inaugural address was a concise but comprehensive survey of the history of tropical medicine and parasitology. The parasites which invade human beings in this area are of great variety. One of the latest to be discovered is the *Treponema hispanicum*, described in 1926 by Sadi de Buen, who presented the first report to the congress on this subject. The disease it provokes, Hispano-African spirochætosis, is most troublesome, if not fatal. This recurrent Spanish fever lasts a month or longer, with five or more remissions. The first bout of fever usually continues for three to eight days, and is followed by an apyrexial period of four to six days. The second attack seldom lasts as long as the first. Spontaneous recovery is the rule, and treatment has hitherto proved incapable of shortening the disease. The virus is transmitted by the tick *Ornithodorus erraticus*. The first animal convicted of acting as a host was the pig, and several other

animals have since been incriminated, notably small rodents, the fox, and the porcupine. Dengue was another disease about which interesting discussions centred, and it would seem that, in addition to the mosquito campaign, preventive vaccination holds out prospects of success. A third Mediterranean disease coming under review was exanthematic Mediterranean fever, which is now known to be conveyed by a tick, the dog being the commonest host of the virus. The congress also dealt with the problem of rats on board ships and the chlorination of water. With regard to the former subject, Dr. Lutrario, former director-general of the Public Health Service of Italy, insisted that the most effective of all the remedies against rats is rat-proofing, and that if the campaign against rats on board ships is to be really effective, it must also be conducted relentlessly in ports and adjoining areas.

UNDULANT FEVER IN FRANCE

The work of Prof. Lisbonne, of Montpellier, is doing much to bring France into line with such countries as Denmark and the U.S.A. where a growing proportion of cases of pyrexia of unknown origin is being traced to Bang's bacillus and other bacilli of the same type. The undulant fever research centre at Montpellier has, in the course of a year and a half's research, discovered 28 cases, at least 20 of which have been verified by bacteriological examinations. Fourteen of these cases have been traced to *Br. melitensis*, and only six to *Br. abortus*. The geographical distribution of these cases is instructive. The abortus cases occurred in such areas as the Aisne and the Vosges, where the *Br. melitensis* of caprine and ovine origin is practically unknown. On the other hand, the melitensis cases occurred in the south and south-east of France. Prof. Lisbonne and his coöperator, Dr. L. F. Vidal, are inclined to consider *Br. abortus* as but slightly pathogenic to man, and they do not think that it will play any but a secondary rôle in human pathology in France. They have much greater respect for undulant fever due to *Br. melitensis* of bovine origin. They and other workers have reasons for believing that the goat and the sheep are passing on their infections to cattle, whence human beings become infected. They therefore disapprove of the practice of farmers in certain areas who let sheep and goats browse with cattle. It is by a process of transmission of infection from goat and sheep, through cattle, to man that they fear undulant fever may become endemic throughout France.

PUBLIC HEALTH SERVICES

Antituberculosis Work in Sheffield

THE campaign against tuberculosis in Sheffield continues to make progress when judged by mortality results. The death-rates in 1931 both from pulmonary and all forms of tuberculosis beat all previous records. Thus these rates per million were 673 and 818 respectively and may be compared with 1001 in 1209 for the first year of the last decade, and with 742 and 896 for England and Wales in 1931. Among the 18 towns in England and Wales with populations exceeding 200,000, Croydon was the only one which obtained more favourable results in 1931 than Sheffield —namely, 663 and 774. There were in Sheffield, during 1931, 232 male and 116 female deaths from the pulmonary form of the disease, so that if the death-rate for the population of over 265,000 females is calculated separately we obtain the rate of 438 per million, a truly remarkable figure if one is familiar with Sheffield's housing problem, or studies the activities of the corporation with regard to slum clearance and demolitions. The grinding industry is still a black spot, and among the 5000 grinders there were 36 deaths in 1931, as compared with an average of 32 for the previous seven years. Dr. John Rennie gives five factors as being the most important in securing the success obtained. (1) The complete coöperation of the medical profession; (2) the provision of adequate sanatorium and hospital accommodation; (3) the treatment of a large number of early cases discovered by the examination of suspects and contacts; (4) intensive work in the isolation of infectious cases; and, latterly, (5) the re-housing of families which include an infectious case of tuberculosis.

Some particulars which serve to illustrate Dr. Rennie's contention may be given from the report of Dr. H. Midgley Turner, the clinical tuberculosis officer.

Of 1515 new notifications in 1931 tubercle bacilli were found in the sputum of 21·2 per cent., and a large proportion of the remaining 78·8 per cent. were in the early and curable stage of the disease. The suspects sent to the dispensary for diagnosis numbered 2697 and 89 per cent. of the notified cases were sent to the dispensary prior to notification. The ultimate diagnosis of the suspects (who paid 12,846 visits to the dispensary) entailed much work and the use of observation beds and skiagrams and a similar statement applies to the examination of 3199 contacts from the homes of notified cases. The beds available for respiratory tuberculosis numbered 511, and a long waiting-list is a thing of the past.

Stress is laid on the importance of diagnosing and treating "minor" tuberculosis in children, and 72 places are reserved at the open-air schools for children selected by the tuberculosis officer. Tubercle bacilli were found in the sputum of seven children, whose names were therefore removed from the school registers and two of these have since died. Of the 1342 infectious cases on the register 51 per cent. had a separate bedroom and 26·4 per cent. a separate bed. Frequently a separate bed is available and not used and this is more common in the somewhat better residential districts than in the poorer districts of the east end.

The scheme for re-housing infected families on special terms began in 1928. Up to now 116 families, including 560 contacts, have been re-housed, of which 78 are still in the scheme, whilst in the case of 38 the special tenancies have been terminated owing to the removal of the need. In 17 cases the re-housed family remains on in a council house on an ordinary tenancy. Other authorities, it seems, are imitating this re-housing scheme.

Variety in School Medical Work

The Ministry of Health has indicated a method of whole-time appointment in which a medical officer would work under the local authority in general sanitary matters and under the county council in connexion with the health of school-children, child welfare, and tuberculosis. Under such a scheme the medical officer would not be so wholly occupied with school medical inspection as he is at present, and though medical inspection is not always dull work, it does as Dr. T. N. V. Potts puts it "run on a narrow gauge" and there are few who do not need the refreshment of occasional variation. It would be of benefit too, if, after a specified number of years of continuous service, a member of the staff could be granted study-leave for post-graduate courses approved by the Board of Education. Opportunity for clinical meetings would be beneficial if difficult cases could be collected and discussed. Hospitals under county management would, Dr. Potts thinks,

provide an excellent complement to existing services. He writes:—

"A class of child of particular interest is the one who is subnormal in health without suffering from any complaint to which a label can be attached. Even with the help of information given by health visitors and parents, the diagnosis is very difficult—mostly guesswork based on probability—and everyone faced with such a difficulty wishes for an opportunity of observation such as can only be provided by hospital treatment. Such facilities would form an ideal opportunity for gaining accurate information, and clinical meetings and free discussions would be a real help towards accuracy of diagnosis. General hospitals are too busy and their honorary staffs could not be expected to hold clinical meetings and lead the discussions on such cases unless they hold official positions as consultant medical officers to the education committee. On the other hand general hospitals managed and staffed by officials of the county would amply supply this desideratum."

Another method of increasing the interest of school doctors in their work is the encouragement and organisation of research into problems that are specially found in the work of this service, and whose elucidation is of value to the medical profession as a whole. This method is exemplified in the West Riding report itself by a special investigation into the causes of blepharitis by Dr. R. L. H. Davy, who in 64 cases found the causative factors to be: eczema or dermatitis in 17; delicacy with enlarged glands or tonsils or carious teeth in 23; defective vision in 26. Doubtless refractive errors were present in a larger number than this, for she remarks how often the chronic cases did not yield to yellow-oxide ointment until a little atropine was added to remove the strain of accommodation. And in a study by Mr. J. Mackay, L.D.S., of the effect on the teeth of biscuits given with milk. Caries, he says, is produced because the milk gums down the biscuit to the buccal convexity of the molars, the cheek assisting to keep the plaque adherent. The resulting cavity though small is troublesome to fill owing to its inaccessible position.

Growth of Subnormal Children

Mentally subnormal children are subnormal in height, weight, and growth. Practically all authorities agree on this. A passage in the report of the chief medical officer of the Board of Education for 1929 runs: "It should be remembered that mental defects of all kinds and degrees bear a closer relation to physical and social conditions than is often assumed." But Dr. Leslie Cronk tells us this does not hold for the special school at Larkhills, Hants, where systematic measurements have been made. Figures given in his report are these:—

Age-group.	Height of M.D.'s.	Standard height.	Weight of M.D.'s.	Standard weight.
15 to 16	61·82	61·8	106·7	99·3
14 to 15	59·38	58·0	93·4	86·1
13 to 14	57·15	56·2	83·2	76·5
12 to 13	55·62	55·0	75·79	71·6
11 to 12	53·75	52·7	70·04	64·6
10 to 11	52·20	51·3	66·43	59·6
9 to 10	51·51	49·2	63·82	54·8
8 to 9	49·84	47·0	59·8	51·0

The standard heights and weights given are the means of the Anthropometrical Committee (1927). Dr. Cronk adds the figures of the Board of Education (1913) and of Dr. Corry Mann (1926) and the measurements of the mentally defective boys at Larkhills are much superior to them all at every age.

The percentage annual increments of growth were for height:—

	14–13	*13–14*	*12–13*	*11–12*	*10–11*
M.D.'s	3·99	3·83	3·67	4·06	4·18
Normals	4·43	3·73	2·17	3·59	4·21

and for weight:—

	14–13	*13–14*	*12–13*	*11–12*	*10–11*
M.D.'s	11·04	10·43	11·22	8·29	10·28
Normals	12·07	8·53	6·52	9·41	10·04

Normals being the increments given by the Board of Education.

The comparison is mostly in favour of the boys at Larkhills. The results are striking, although the numbers were small—not much over 50 in all—and the standards for both height and weight have tended to increase during the past five years. Larkhills is, however, a residential school where food and living conditions are excellent. Thus the results, though of considerable interest, do not prove that *under similar conditions* the mentally defective are up to the average stature of the population.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 8TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 17 (last week, 23); scarlet fever, 1934; diphtheria, 935; enteric fever, 62; acute pneumonia (primary or influenzal), 664; puerperal fever, 43; puerperal pyrexia, 94; cerebro-spinal fever, 29; acute poliomyelitis, 48; acute polio-encephalitis, 3; encephalitis lethargica, 14; dysentery, 18; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Oct. 11th–12th was as follows:—Small-pox, 44 under treatment, 4 under observation (last week 42 and 1 respectively); scarlet fever, 1625; diphtheria, 1603; enteric fever, 21; measles, 232; whooping-cough, 320; puerperal fever, 24 (plus 9 babies); encephalitis lethargica, 231; poliomyelitis, 6; "other diseases," 153. At St. Margaret's Hospital there were 19 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 6 (0) from measles, 4 (1) from scarlet fever, 15 (2) from whooping-cough, 30 (6) from diphtheria, 84 (19) from diarrhœa and enteritis under two years, and 31 (3) from influenza. The figures in parentheses are those for London itself.

The deaths from diarrhœa were still maintained, the highest figures being Liverpool 9, Leeds 6, Hull, Newcastle-on-Tyne, and Birmingham, each 4. Diphtheria accounted for 3 deaths at Hull.

The number of stillbirths notified during the week was 258 corresponding to a rate of 41 per 1000 total births), including 37 in London.

NURSES' HOME AT NORFOLK AND NORWICH HOSPITAL. On Saturday last the Queen opened the new nurses' home at this hospital. The building, which has cost £30,000, forms part of the Queen Alexandra Memorial Wing, and completes an extension scheme that has cost £160,000. It was stated that every parish in Norfolk and every street in Norwich had given to the fund, with the result that it was over-subscribed by £2000, which was used to pay for the fittings and furnishing. The money was handed to the Queen by 155 purse-bearers. The new four-storeyed building contains 170 rooms, of which 103 are bedrooms. Each bedroom measures 10 ft. by 8 ft., and for economy of space is fitted with a built-in wardrobe, consisting of hanging wardrobe, long mirror, cupboard, shelves, and writing table. On each floor there are two toilet rooms fitted with four fixed wash-basins, and four bathrooms, allowing one bath for every seven nurses. Also, there are a shampoo room, a boot room, and a small laundry. Fixed wash-basins, with hot and cold water-supply, are provided in the sisters' bedrooms on the first floor, and private sitting-rooms adjoin the bedrooms of the senior sisters. There is also a sisters' common room on this floor. On the ground floor is a large lecture hall with walls covered with sound-absorbing material, together with a "quiet room" for study.

CORRESPONDENCE

TAXATION OF COD-LIVER OIL

To the Editor of THE LANCET

SIR,—The possibility of a rise in the price of cod-liver oil as a result of the Ottawa proposals must arouse some anxiety in the minds of all who are concerned with the welfare of little children, especially those of the poorer class. Cod-liver oil has a value in early life which cannot easily be replaced—unless indeed any adequate supply can be obtained of other fish-liver oils which have similar properties; that there are such is known, and I have myself experimented with them in the treatment of rickets. The oil of *Gadus morrhua* is at present the one in common use, and the curtailment of its availability would be a misfortune for children. The various proprietary preparations assiduously advertised as concentrated vitamins, and some of them as a sort of multum-in-parvo substitute for cod-liver oil, besides being far more costly than the oil itself, lack certain properties which are particularly valuable in that oil, for it is not only as a vitamin-purveyor, but also as an oil with other valuable characteristics of its own that cod-liver oil is of use.

For those whose circumstances make a liberal use of eggs and milk and cream a simple matter, cod-liver oil is unnecessary, but for the poorly fed, who cannot obtain these foods in any adequate quantity, cod-liver oil is of very great value, and it would be a bad day for the children when the price of cod-liver oil rose sufficiently to prevent its use for every child who is needing it—and there are many.

I am, Sir, yours faithfully,

Queen Anne-street, W., Oct. 14th, 1932. G. F. STILL.

To the Editor of THE LANCET

SIR,—In the Oliver-Sharpey lectures for 1932 I have already expressed a view in entire agreement with the substance of your article on the taxation of cod-liver oil, that "for infants and growing children it is probable that a small daily ration of cod-liver oil, given especially during the winter months, is the surest and most economical procedure . . . to obtain the necessary supply of antirachitic vitamin for the poorer section of the population."

In this country, in winter, no antirachitic effect can be derived from the sunshine, which is not only very limited in amount, but also depleted of those ultra-violet rays of short wave-length, which possess antirachitic properties. Reliance for a supply of vitamin D must, therefore, be placed on diet. The diet of the poorer classes is, of necessity, deficient in this vitamin, which is found only in the relatively expensive foodstuffs; eggs, milk, butter, and other animal fats. In winter moreover the amount contained in these foods is seriously diminished, and the relative richness of cod-liver oil makes even a small ration of the greatest value.

It is evident, therefore, that any steps which may raise the price and lower the consumption of cod-liver oil cannot fail, especially in winter, to have a deleterious effect on the health of the population, involving particularly the well-being of the children of the poorer classes.

I am, Sir, yours faithfully,

HARRIETTE CHICK.

Lister Institute of Preventive Medicine,
Chelsea Bridge-road, Oct. 17th, 1932.

*** The increasing use of cod-liver oil in the feeding of stock animals is also of importance to human nutrition, because it tends to raise the vitamin-D content of the milk, butter and animal fats. As Dr. Chick points out, this is seriously reduced during the winter, when sunshine is scarce.—ED. L.

MARMITE IN PERNICIOUS ANÆMIA

To the Editor of THE LANCET

SIR,—I have read with great interest Dr. Goodall's paper (Oct. 8th) on the treatment of pernicious anæmia by marmite. In the opening paragraphs he refers to a previous publication of mine,[1] in which I suggested that the anti-anæmic factor of liver and vitamin B are not identical substances. As this is still my opinion, I should be obliged if you would publish the following observations.

Three cases of pernicious anæmia in the relapse stage were treated by Dr. Goodall with large doses of marmite (half an ounce three times a day), and responded with reticulocyte crises and rises in the blood level. This is not perhaps the place for me to discuss whether the height of the reticulocyte crises and the speed of blood regeneration in these cases were comparable to that obtained by the use of active liver preparations. In my previous publication I reported that one case of pernicious anæmia responded to marmite but others failed to do so, while they subsequently responded satisfactorily to oral or parenteral liver therapy. Since the publication of this paper I have treated with marmite three other cases of pernicious anæmia in the relapse stage; one responded and two failed. Some observations on these cases would appear to be of interest.

About a year ago there were two cases of pernicious anæmia in my wards at the same time whose blood counts were practically identical (just over one million) and whose gastric contents were completely deficient both in ferments and hydrochloric acid, even after histamine injection. They were both placed on marmite, ʒii. three times a day. One responded with a typical reticulocyte crisis and a rise in the blood level to normal, and has since remained normal on ʒi. of marmite three times a day. The other completely failed to show any response, and after three weeks' treatment was given a fish-liver extract made in my department, which produced a 30 per cent. reticulocyte crisis within a week, and a threefold rise in the blood level in three weeks. The only point of difference between these two cases which I could discover was that the one which responded to marmite had been anæmic for less than six months, while the other had been anæmic for three years.

That the majority of patients suffering from Addisonian anæmia fail to respond to vitamin-B preparations is clearly shown by the carefully controlled series of cases recently published by M. B. Strauss and W. B. Castle,[2] in which the administration of 12 g. daily of an autolysed yeast product was entirely ineffective. When this product was incubated with normal gastric juice it was found to be active. The present position in regard to vitamin B in the treatment of macrocytic anæmias may be summarised as follows: It is efficacious in tropical macrocytic anæmia, in cœliac disease, in many cases of sprue, and in some cases of Addisonian anæmia. In the first three conditions the intrinsic factor of Castle is produced by the stomach in normal or subnormal

[1] THE LANCET, 1931, ii., 1395.
[2] Ibid., July 16th, p. 111.

amounts; in pernicious anæmia it is usually not produced at all. It must be remembered that the power to secrete this intrinsic factor is not suddenly lost, but gradually decreases. If excess of the extrinsic factor be given in a concentrated form, a response to treatment will result provided any intrinsic factor is present. Vitamin-B preparations apparently contain the extrinsic factor in a concentrated form. There is evidence to show that during a remission an improvement in the secretion of the intrinsic factor may occur, and it may possibly be for this reason that the administration of concentrated extrinsic factor, as in marmite, may be of value. Whether the extrinsic factor is vitamin B or some amino-acid present in the concentrate, and which is necessary for blood formation, is a question to which no definite answer can at present be given. Castle believes that the former is the correct explanation, but in view of the large dosage of the preparations required, the possibility of the latter being responsible cannot be neglected. If marmite (vitamin B) is the extrinsic factor in a concentrated form, then it cannot be the same as the anti-anæmic principle of liver, since this is the product formed in the stomach by the interaction of the extrinsic and intrinsic factors, and subsequently stored in the liver. Since many cases of pernicious anæmia in the relapse stage fail to respond to vitamin-B preparations, it would be very unwise at the present stage to suggest that marmite can replace liver and hog's stomach preparations in the treatment of Addisonian pernicious anæmia.

I am, Sir, yours faithfully,

STANLEY DAVIDSON.

University of Aberdeen, Oct. 17th, 1932.

PRE-NURSING COURSES

To the Editor of THE LANCET

SIR,—I am no longer in active work, and cannot claim to be in touch with the needs of the nursing world of to-day, but I have read with great interest parts of the Final Report of THE LANCET Commission on the subject. It seems to me that the establishing of centres for the teaching of elementary anatomy, physiology, and hygiene would be very costly. If the authorities of existing university medical colleges could be induced to form classes for women on the lines of enclosed syllabus, it would leave the nurses' training schools free to deal with clinical teaching only—i.e., if these schools and the State examiners would agree to accept the university certificates as sufficient evidence of the fitness of a pupil to continue her studies as a professional nurse, thus maintaining a one-portal system. There would require to be a very stringent rule as to the length of time allowed between the taking of said certificates and the entering of a nurses' training school.

The clinical teaching could then be carried on with a degree of relief for all concerned. At present the requirements of a sister tutor are such as to require an M.B. at least to meet them.

I am, Sir, yours faithfully,

Edinburgh, Oct. 11th, 1932. REBECCA STRONG.

*** At the time when the Final Report of THE LANCET Commission was issued it was decided to publish no comments on its findings, since the selection of some letters from the many received would have proved an invidious task. An exception is here made in view of Mrs. Strong's unique contribution to nursing history. Now in her ninetieth year, she entered in 1867 the Nightingale Training School at St. Thomas's Hospital, which had been founded in 1860. On completion of her training she went as one of six nurses to the Royal Hants County Hospital, and a year later formed one of the first batch of Protestant "sisters" to be employed in the British army. In 1874 Mrs. Strong became matron of the Royal Infirmary, Dundee, and in 1879 of the Royal Infirmary, Glasgow. Resigning in 1885 because of her inability to secure better accommodation for her nurses, she was reappointed six years afterwards, and organised in January, 1893, a pre-nursing course, consisting of 12 lectures each in anatomy, physiology, and hygiene, of which the syllabus, to which she refers above, coincides to a remarkable extent with modern requirements. Her endorsement of the principles which form the basis of Recommendations XL. to XLIII. of THE LANCET Commission on Nursing are timely, in view of the differences of opinion with which these recommendations have been met in the nursing profession. (See *Nursing Times*, Oct. 15th, pp. 1056 and 1062, and *Nursing Mirror*, Oct. 15th, pp. 42 and 52.) In this connexion a letter from the president of the Association of Head Mistresses in the *Times* of Oct. 14th is of moment. After referring to the widespread interest created by the report of THE LANCET Commission, Miss Strudwick continues:

"The Executive Committee of the Association of Head Mistresses, at a meeting held on Oct. 8th, after a discussion upon the report, passed a resolution warmly endorsing the recommendation made in it that the Preliminary State Examination for Nurses should be divided into two parts. The object of this suggestion is to make it possible, though not compulsory, for the intending nurse to take the first part, consisting of anatomy, physiology, and hygiene, before she enters hospital. We feel convinced that adequate preparation in these subjects could be given in many of our schools; it is already being given in some. If the girl could master the elements of these subjects in advance it would greatly lessen the strain of her first year in the hospital, when, after a long day's work in the wards, she has to study them in the evenings.

We note with satisfaction that the General Nursing Council for Scotland has already passed a resolution in favour of this change, and wish to record our hope that the General Nursing Council for England and Wales will also decide to approve of it, since we believe that its adoption will attract to hospital service a large number of suitable candidates from the higher forms of our schools."

This statement will encourage members of the nursing profession who are pressing for such a change.—ED. L.

USE OF THE WORD "HYPODERMIC"

To the Editor of THE LANCET

SIR,—Medical men confine the use of the word "hypodermic" to drugs which may be given subcutaneously, but druggists apply it to any drug which is suitable for use with a hypodermic syringe. Drugs such as tartar emetic, which can be given only intravenously, have even been included in a list of preparations for hypodermic injection. To avoid confusion the term "hypodermic" should, I think, be confined to drugs which may be administered just under the skin, and drugs such as tartar emetic should be designated "For intravenous injection only." I am, Sir, yours faithfully,

Durban, Sept. 23rd, 1932. F. G. CAWSTON, M.D.

SAFE MILK

To the Editor of THE LANCET

SIR,—I see that my query in the *Times* as to whether Grade A (T.T.) milk, as supplied to the schools, is altogether free from risk has been commented on in your correspondence columns. Mr. D. S. Rabagliati, in what I take to be an attempt at defensive pleading, appears to me to turn King's evidence and to have

yielded information concerning the constitution of the herds that enables us to accept Dr. Gloyne's finding without reserve. I raised my query in the hope that school medical officers would become articulate and inform us what their experience has been in the matter of milk schemes. I hope their silence does not indicate that the story is too tragic to tell.

I am, Sir, yours faithfully,

W. R. DUNSTAN,
M.O.H., Lewes, &c.

Oct. 17th, 1932.

THE INCREASE IN ARSENIC-RESISTANT SYPHILIS

To the Editor of THE LANCET

SIR,—Since I have made a fairly complete—and I hope, a completely fair—criticism of Drake and Thomson's report which gave rise to this correspondence, in an article which will appear in a forthcoming number of the *British Journal of Dermatology and Syphilis*, I do not propose to continue the discussion in these columns. Everyone will surely homologate Dr. Semon's endorsement of Dr. Browdy's platitude that it is not syphilis but the patient that we have to treat. That is a postulate writ large upon every page of therapy. Although we may loosely talk of treating a disease, we really mean that we treat a person who is suffering from a disease, for a disease cannot exist apart from a person. The two are inseparable. In syphilis there are always the two elements—the patient and the parasite. The former has to be treated, the latter has to be attacked; and the attack must not damage the patient either by its intensity or by its inefficiency. I realise that I am perpetrating further platitudes, but I am constrained to do so because I detect a suggestion—which is of course utterly wrong—that I am advocating some hideous form of mechanical standardisation. All I appeal for is adequacy, and the full and rational utilisation of our modern resources against syphilis.

I am, Sir, yours faithfully,

E. TYTLER BURKE.

Municipal Clinic, Salford, Oct. 15th, 1932.

PANEL AND CONTRACT PRACTICE

The Voice of the Panel

As we go to press, the annual conference of representatives of local medical and panel committees is being held at B.M.A. House, and it may be worth while to consider for a moment how the ordinary insurance practitioner can get his ideas brought before the appropriate tribunal. The full title of the conference quoted above might suggest that there were two sorts of committees whose representatives were conferring. This may be so in one or two areas, but in the great majority the personnel of the panel committee and of the local medical committee is now the same. When the first N.H.I. Act came into force it was thought advisable to have a committee to represent those doctors who were under contract with an insurance committee. This "panel" committee, to the extent of three parts at least, consists of insurance practitioners elected for two or three years by the direct votes of insurance practitioners in the committee's area. The voting is taken by post or at a polling-station where a meeting for the purpose is held, and is often addressed by members of the outgoing committee or from other areas. It is pitiful to see how badly these meetings are attended and what indifference is shown in the election of a man to voice the ideas of his constituency.

The work of the panel committee is honorary, some allowance at times being made for subsistence and train fares. Possibly more interest would be taken in the work if those who undertook it were remunerated out of the pockets of the large indifferent majority. The costs however do come out of the insurance practitioner's pocket, whether by a tax on the practitioners' fund for the area or by a special voluntary levy. Panel committees now do so much statutory work on behalf of the Government, such as investigating excessive prescribing or certification, that it hardly seems fair for the expenses to be borne entirely by medical practitioners working under the Act without any help from (say) the Ministry of Health. To go back to the first Insurance Act, the Government felt that whilst they would undoubtedly want to know the views of insurance practitioners working the Act in a particular area, they might also want to know the views of all doctors in that area, and so the "local medical" committee was set up representative of all doctors in the area, questions which affected the profession as a whole being referred to it. In the early days when there was still much opposition to the Act it was thought that the panel committee and the local medical committee might be quite different bodies. Now the same doctors usually act for both committees.

There is a panel committee to correspond with every insurance committee, and the latter has to consult with the panel committee when it wishes to do anything which involves a change in the terms of service or the conditions of practice. The panel committee, elected as stated above, sends representatives to the medical service subcommittee of the insurance committee, in the same number as the insured person's representatives. It is also represented on the insurance committee itself, and on its allocation subcommittee which deals with insured persons who fail to choose a doctor within a certain time. The panel committee, or a group of them depending on the size of the area, sends representatives to the Insurance Acts Committee, which is the main medical committee of the whole service; to this body the Minister refers matters for discussion and decision, knowing that it represents insurance practitioners and that its decisions will in all probability be carried out. The I.A.C. consists of able men with keen perception and alert intellect, all familiar with the trials and pitfalls of insurance practice. It meets in London every two or three months and draws up a report of its work which it presents through its chairman to the panel conference. To this conference each panel committee sends one or more representatives, depending upon the size and constitution of the committee. The conference decides matters not sufficiently urgent to require immediate action by the I.A.C., but upon which the I.A.C. may have come to some decision itself. Thus at the conference this week the subject of anæsthetics will have been discussed and directions given to the Insurance Acts Committee as to how they are to negotiate on the subject with the Ministry. Membership of the I.A.C. entitles attendance at the conference, but not the right to vote. Representatives of the panel committee at this conference will hear the other man's point of view and obtain a broader outlook on matters than those who stay at home. Service on a panel committee is apt to become dull and uninteresting

if all the useful work is retained by one or two men, and none of the others is given a chance to do the bigger things. If the chairmanship and representation on the insurance committee and other outside bodies were by rota, provision would be made for carrying on the work when the older men drop out. The medical profession would do well to look into this aspect of the matter, and even the Minister might consider it worth while to make regulations calculated to arouse more interest in medical administration amongst insurance practitioners in general.

The Defence Trust

The National Insurance Defence Trust was founded in 1919, its trustees being the members for the time being of the Insurance Acts Committee. The objects of the Trust are :—

1. To assist in defraying the expenses incurred in organising or taking any action to protect the interests of the medical profession in connexion with the present National Health Insurance system or any extension or modification thereof.

2. To include, where necessary, financial support of medical practitioners who require such support owing to action taken by them in accordance with any policy laid down or approved by a conference of representatives of local medical and panel committees, or of such committees as may be formed in place of or in substitution for them or either of them, or to which work now discharged by such committees or either of them may, as the result of new legislation, be transferred.

3. The conference referred to in (2) shall take place entirely and solely in the discretion and judgment of the Insurance Acts Committee of the British Medical Association.

In 1926 the panel conference decided there should be no relaxation of efforts to obtain contributions until £250,000 was reached, that information as to the amount of each area's quota should be furnished to all local medical and panel committees, and that any area subscribing its quota might properly suspend further contribution until all other areas had contributed their proper quota or the total amount aimed at had been reached. The present position is as follows :—

—	Percentage of quota subscribed.	Percentage of committees subscribing.		
		100 per cent. or more.	Less than 25 per cent.	Nothing at all.
England ..	73	55	8	4
Scotland.. ..	63	35	18	5
Wales	46	23	47	5

The points which require discussion are :—

(1) What is to be done when £250,000 is reached? Is £250,000 enough?

(2) Are the young people going into practice now in areas where 100 per cent. has been subscribed to make no contribution to defence in case it were needed?

(3) Are the older men in these same areas to cease contributing because £250,000 has been reached, when they are willing to go on with deductions from their panel cheques?

(4) What is to be done with areas which have subscribed nothing in the event of help being needed for defence purposes?

(5) What is the proper use of interest from the investment of these funds? Should it be added to capital or should it be used for purposes which are consistent with the objects of the Trust?

It has been suggested that part of this interest might be used (1) to pay for lectures to final-year students on insurance practice; (2) to help aged and infirm insurance practitioners in their retirement. The interest is already used to defray the expenses of the Insurance Acts Committee, including the rail-fares of its members in attending meetings, as well as the fares of all members of the panel conference who claim them, all of which comes quite definitively within the first object of the Trust. The retirement from the Service of infirm and aged practitioners who have become a danger and a source of adverse comment is also definitely action taken to protect the interests of the medical profession. The same argument might be applied to giving lectures on national health subjects to young men about to qualify; such knowledge would save a doctor many an anxious moment before a medical service sub-committee.

Vacancies

For further information refer to the advertisement columns

Barnsley, Beckett Hospital and Dispensary.—Res. Surg. O. Also H.P. £300 and £200 respectively.
Birmingham and Midland Ear and Throat Hospital.—Asst. Surg. O. £200.
Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. All at rate of £200.
Blackburn County Borough.—Asst. Dentist. £450.
Blackpool County Borough.—Asst. School M.O. £550.
Bradford Royal Infirmary.—H.P. and H.S. Each at rate of £135.
Cancer Hospital, Fulham-road, S.W.—Hon. Neurologist, Hon. Dermatologist, Hon. Gynæcologist. Hon. Ophthalmic Surgeon.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.
Chester Royal Infirmary.—H.S. £150.
Colchester, Royal Eastern Counties Institution, &c.—Res. Asst. M.O. £350.
Croydon General Hospital.—Asst. Physician.
Great Yarmouth General Hospital.—H.S. £140.
Greenwich, Dreadnought Hospital.—Asst. Radiologist. 50 gns.
Hertford County Hospital.—Hon. Ophth. Surgeon.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Surgeon to Ear, Nose and Throat Department.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
London Jewish Hospital, Stepney Green, E.—Res. M.O. and Cas. O. Each at rate of £150. Also Jun. Res. M.O. At rate of £100.
Liverpool, Alder Hey Hospital.—Res. Asst. M.O. £200.
Liverpool Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.
Liverpool, Smithdown-road Hospital.—Res. Asst. M.O. £200.
Liverpool University.—Junior Lecturer for Dept. of Pathology. £300.
Manchester, Christie Hospital and Holt Radium Institute.—Hon. Asst. Surgeon.
Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.
Middlesex County Council.—Asst. County M.O.H. £750.
Minehead and West Somerset Hospital.—Res. M.O. At rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Two Res. Anæsthetists. Each at rate of £150.
Nottingham City Mental Hospital.—Jun. Asst. M.O. £350–£450.
Plymouth, South Devon and East Cornwall Hospital.—Res. Surg. O. and H.S. to Special Departments. At rate of £150 and £100 respectively.
Putney Hospital, Putney Common, S.W.—Hon. Consultant Ophth. Surgeon and Oto-Laryngologist.
Royal Chest Hospital, City-road, E.C.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Hon. Asst. Surg.
Royal Free Hospital, Gray's Inn-road, W.C.—First H.P. Asst. M.O. for V.D. Dept. £350. Also Gynæcological Registrar and First Asst. in Children's Dept. Each at rate of £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. and H.P. £200 and £100 respectively.
St. George-in-the-East Hospital, Raine-street, E.—M.O.H. £950.
St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—Two Hon. Asst. Physicians.
St. Mary's Hospital, W.—Hon. Anæsthetist.
St. Olave's Hospital, Lower-road, Rotherhithe, S.E.—H.P. At rate of £80.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.
University College Hospital, Gower-street, W.C.—First Asst. for Children's Dept. £250.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Asst. Surg.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Med. Supt. £1100.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Med. Staff, Ophth. Surgeon.
Willesden, Municipal Hospital, Brentfield-road, Neasden, N.W.—Res. M.O. £250.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Normanby (Yorks) and Whalley (Lancs).

MEDICAL NEWS

University of Oxford

On Oct. 13th the degree of Bachelor of Medicine was conferred on A. W. D. Leishman and O. J. Vaughan Jackson.

University of Manchester

At recent examinations the following candidates were successful :—

D.P.H.

Part II.—Charlotte E. Forsyth and V. A. Newton.

University of Dublin

At recent examinations in the School of Physic, Trinity College, the following candidates were successful :—

M.D.

W. E. Hutchinson and T. F. M. Woods.

FINAL MEDICAL EXAMINATION FOR M.B., B.CH.

Part I.—Old regulations : H. L. Connor, C. L. Greer, B. E. W. Aldwell, and P. St. G. Robinson.

New regulations : Marie J. S. O'Toole, W. G. B. Halliden, A. F. J. Delany, J. F. Harbinson, A. E. Fannin, A. R. S. Jessop, R. C. Tyner, H. M. Glover, Doris E. Morton, and D. J. O'Shaughnessy.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

Joseph Borg and Anis El S. El Khishin.

Royal College of Surgeons of England

A quarterly meeting of the council was held on Oct. 13th, with Sir Holburt Waring, the president, in the chair.

Diplomas of Fellowship were granted to George Frederick Langley (Bristol) and William Eric Archer Hughes-Jones (Melbourne and St. Bartholomew's), and a diploma of Membership was granted to H. F. Moseley (McGill and St. Thomas's).

It was announced that Sir Buckston Browne had now completed his gift of £100,000 for building and endowing the Surgical Research Farm at Downe, Kent. Sir Henry Wellcome was admitted an honorary fellow of the College, and Mr. Herbert Alstead, late of Wigan Grammar School, was admitted the third Macloghlin scholar.

The council passed a resolution of condolence on the death of Sir Charters Symonds, past vice-president of the College.

The three museum demonstrations by Sir Arthur Keith, arranged for Fridays, Oct. 21st and 28t hand Nov. 4th, have been postponed.

The Meath Hospital

Our Dublin Correspondent writes :—The Meath Hospital is the only one of the Dublin clinical hospitals which preserves the old custom of opening the session with an address to the students. This duty was performed last week by Sir John Moore, who has now entered on his 58th year of service as a physician to the hospital, having been appointed to succeed William Stokes in 1875. The subject of his address was the Medical Student at Hospital, and he devoted himself mainly to a discussion of the responsibility attaching to the profession of medicine. On the evening of the following day, Sir John presided at a dinner at the Gresham Hotel, at which some 70 present and past students of the hospital and their guests attended. Among the guests were the president of the Royal College of Physicians of Ireland, and the president of the Royal College of Surgeons in Ireland.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly meeting of the court of directors held on Oct. 12th, Mr. V. Warren Low, the president, being in the chair, the death was reported of a widow who had been in receipt of grants since 1918. Her late husband had paid in subscriptions £52 10*s*., the maximum amount that any member pays. His widow received a total sum in grants of £1100. The death was reported of three members, and application for relief from their widows. They were each granted £50 per annum from the ordinary funds, two, being over 65 years of age, £25 per annum from the Brickwell Fund each, and the third, being under 65, a grant of £10 per annum from the same fund. A sum of £176 15*s*. was voted as special grants to widows, to enable them to continue with the education of their children, who had reached the age of 16, at which age the ordinary grants cease. It was decided to make a Christmas present of £15 to each widow over 75, £10 to each widow under that age, and £10 to each orphan—at a cost of £640. Three new members were elected. Membership is open to any registered medical practitioner, who at the time of his election is resident within a 20-mile radius of Charing Cross. Particulars from the secretary, 11, Chandos-street, London, W.1.

Bio-Chemical Society

The meeting of this society is being held at 4 P.M. to-day, Friday, Oct. 21st, at the National Institute for Medical Research, Hampstead.

St. Peter's Hospital for Stone

A post-graduate course will be held in the pathology department of this hospital, 10, Henrietta-street, London, W.C. 2, at 3 P.M. on Wednesdays, from Nov. 2nd to Dec. 21st. A full syllabus may be had from the secretary of the hospital.

Donations and Bequests

The late Mr. Benjamin Hopkin Morris, of Chiswick, left £1000 to Merthyr Tydfil Hospital in memory of his mother, for the endowment of a "Mary Morris" Bed (unless provided in his lifetime), and £1000 to the West London Hospital for the endowment of a "Fanny Hopkin Morris" Bed (unless already given in his lifetime).

University of London Medical Graduates Society

An extra-metropolitan dinner was held on Oct. 13th at the Grand Hotel, Brighton, with Lady Barrett, M.S., the president, in the chair. She pointed out that the society was developing that corporate spirit among the graduates of the medical faculty which the new University building, when erected, should do so much to promote. Mr. McAdam Eccles announced that the membership of the society had now reached 500.

Medical Sickness, Annuity, and Life Assurance Society

Following the quinquennial valuation on June 30th the directors of this society have recommended the following bonuses, subject to confirmation by the annual general meeting on Nov. 16th. Sickness Fund : reversionary bonus, per £1 1*s*. insured, of 12*s*. on all with-profit policies providing for immediate benefit, and ceasing at ages 65 or 60, with proportionately lower bonuses for policies ceasing at other ages, and for those with deferred benefits. Life Assurance Fund : reversionary bonus of £1 3*s*. per cent. on the sum assured in respect of all with-profit whole life and endowment assurances. It is stated that full provision has been made for depreciation of stocks, and that ample reserves set aside for contingencies.

Surgical Instrument Manufacturers' Association

The annual dinner of this association was held at the Holborn Restaurant on Oct. 14th, with Mr. Patrick C. Maw in the chair. After the loyal toasts had been honoured, Mr. Duncan G. Fitzwilliams proposed "The Association," coupled with the name of the chairman. The manufacturing trade and the surgical profession must, he said, stand together. The trade had been badly injured by the tendency of hospitals to buy foreign-made apparatus, but much good had been done by the Government's change of policy. The appeal which he had made by letters to the medical and nursing press had, he hoped, met with a satisfying response ; he promised to inquire how many hospitals had adopted his suggestions, and to do his best to interest the council of the Association of Surgeons of Great Britain and Ireland. He could not see, he said, why the people of this country should pay wages to the foreigner when they themselves were out of work. He had tried a complete set of rubber operating furniture, with very satisfactory results, and had determined to install it throughout the hospital, but the manufacturers had made no reply to his request for a quotation made 18 months ago. He told the Association that if its members would manufacture rubber furniture it would sweep the country and entirely displace metal appliances. Mr. Maw, in reply, blamed public bodies as well as hospitals for buying foreign-made goods, mentioning, as an example, the action of a certain county council in specifying on its tender forms a foreign brand of enamel-ware which could be equalled or surpassed in this country. The industry was, he said, largely an hereditary one ; his own firm had been founded by his great-great-grandfather, and his grandfather had trained Mr. A. W. Down, the first chairman of the Association. Mr. E. W. Mayer, in proposing "The Guests," warned users of surgical instruments that if no work could be found for the men, in a few years' time there would be no men available for the work. It took six or seven years to train a good maker of surgical instruments, and at present no fresh apprentices were being engaged. Sir Charles Hipwood, director of the National Union of Manufacturers, in reply, spoke on the significance of Ottawa to the industries of the country, and Mr. F. Gladstone Hines, president of the Pharmaceutical Society, acknowledged the help his society had received from the Association, in company with other affiliated bodies.

Mental After-Care Association

A meeting of this association will be held at the Springfield Mental Hospital, Upper Tooting, at 3 P.M. on Tuesday, October 25th. Lord Wakefield will preside, and the speakers will include the Dean of Westminster, Miss Ruth Darwin, Mr. E. J. Sainsbury, and Mr. C. L. de Salis. The hospital will be open for inspection. The address of the association is Church House, Westminster.

Glasgow Post-Graduate Medical Association

A series of lectures will be given at 3.30 P.M. on Tuesdays from Nov. 15th in the hall of the Royal Faculty of Physicians and Surgeons, dealing with some practical problems in the light of recent research. They are open to medical practitioners without fee. At 4.15 P.M. on Wednesdays from Nov. 2nd there will be clinical demonstrations. Special courses in ophthalmology will be held at the Glasgow Eye Infirmary; there will be demonstrations at the Ear, Nose and Throat Hospital, and the Radium Institute will give a course on Radium Therapy. Facilities for the study of clinical obstetrics and antenatal work are offered at the Royal Maternity and Women's Hospital. The secretary of the association is Dr. James Carslaw, 9, Woodside-terrace, Glasgow, C. 3.

Ladies' Medical Golfing Society

At the Autumn meeting, held at Selsdon Park on Oct. 14th, the following competitors were successful:—Cecil Leitch Challenge Cup (best net return): Mrs. Collis Browne (5) and Mrs. R. Y. Paton (14), 79, Mrs. Collis Browne winning on the last 9 holes. Scratch, First Division: Mrs. Collis Browne, 84. Second Division: Mrs. Hobson, 108. Handicap Prizes, First Division: Mrs. R. Y. Paton, 93−14=79; Miss Griffiths, 97−17=80; Dr. S. Horner, 90−6=84. Second Division: Mrs. Palmer, 111−19=92; Lady Lett, 113−19=94; Mrs. Mortimer Woolf, 133−29=104. Best Ball Competition: Mrs. Collis Browne and Mrs. Lewis Smith, 77½. Captain's Prize: Mrs. Collis Browne. Greensomes *v.* Bogey: First, Mrs. Oldershaw (14) and Dr. Horner, 2 down; Second, Mrs. Palmer (19) and Miss Griffiths (17), 2 down.

Fellowship of Medicine and Post-Graduate Medical Association

Arrangements for the coming week will be found in our Medical Diary. A week-end all-day course will take place at the City of London Maternity Hospital on Oct. 29th and 30th. The first of a series of three demonstrations on clinical pathology, designed for M.R.C.P. candidates, will be given by Dr. A. Knyvett Gordon, at 10, Bedford-square, W.C., on Wednesday, Oct. 26th, at 8.30 P.M. From Oct. 31st to Nov. 19th an afternoon course in ophthalmology will be given at the Royal Westminster Ophthalmic Hospital, and there will be a course in neurology at the West End Hospital for Nervous Diseases daily at 5 P.M. from Oct. 21st to Nov. 26th. Other courses taking place during November are as follows: medicine, surgery, and gynæcology at the Royal Waterloo Hospital, Nov. 7th to 26th (afternoons and some mornings); diseases of the chest at the Victoria Park Chest Hospital, Nov. 14th to 26th (all day); venereal diseases at the London Lock Hospital, Nov. 14th to Dec. 10th (afternoons and evenings). Further details of these courses may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Birmingham University Dental School

The annual distribution of prizes took place at the Birmingham Dental Hospital on Oct. 13th. Sir Thomas Horder, who presented the prizes, was welcomed by Mr. W. Malcolm Knott, chairman of the surgical committee. In reviewing the work of the year, Mr. Knott said that good progress had been made, and that both the school and the hospital had benefited from their interdependence. He referred particularly to the facilities offered to the students in the study of the use of anæsthetics. The Dental Board of the United Kingdom had made a grant of £500 conditionally on the school doing the same. The money had been spent on new equipment. In conclusion Mr. Knott said that the registration of dentists was going to prove of great benefit to the public, and commented on the many opportunities now offered to the well-trained young man or woman in this profession. Sir Thomas Horder, speaking to the students on the career they had chosen, said that he held heterodox views about careers. He believed that it did not matter what one chose to do so long as one tackled it in the right spirit. He affirmed that the three necessary qualities were courtesy, courage, and concentration. The job his hearers had chosen was one which would bring them into contact with their fellow men and he wished them every success in their calling.

New Operating Theatres at Birkenhead

Lord Leverhulme recently opened new twin theatres at Birkenhead General Hospital. The cost has been £9000; each theatre is 25 ft. long and 18 ft. wide. They communicate, and one of them opens into a corridor giving direct access to the X ray department. The walls are finished in a soft green matt enamel to prevent overstrain and glare; the ventilation is by concealed ducts and electric exhaust fans; shadowless lamps travelling on rails are suspended over each operating table.

International Society of Medical Hydrology

The annual meeting of members and the council meeting of this Society were held in Paris on sunday, Oct. 16th, at the conclusion of the International Congress on Rheumatism which had been attended by a large number of its members from many countries, including South Africa and the United States. In the absence of the retiring president, Prof. W. S. Thayer (Baltimore), the chair was taken by the president vice-gerent, Dr. J. van Breemen (Amsterdam), until the election of the new president, Dr. Paul Ferreyrolles (La Bourboule and Paris). On the retirement of Dr. C. W. Buckley (Buxton) as treasurer, Dr. Lionel Calthrop (Radlett, late of Harrogate) was elected in his place. It was decided to hold the next business meeting of the society at Toulouse in October, 1933, at the time of the Congrès International d'Hydrologie, and the next scientific meeting at Zürich in January, 1934.

London Hospital Dinner

Presiding over a large gathering at the Trocadero on Oct. 13th, Sir Henry Newland echoed Dr. Johnson's: "Sir, when a man is tired of London he is tired of life." Returning to England after 13 years' absence he had set his heart on attending this dinner and felt that his position as chairman made the pomp of emperors look ridiculous. After congratulating the house committee on avoiding Lord Randolph Churchill's mistake of forgetting Goschen, he passed on to congratulate both those whose distinction at the London had led to their appointment at other schools and those whose distinction elsewhere had led to their appointment to the London. In a long series of distinctions of the year he mentioned Sir Ernest Morris's knighthood, Lord Dawson's success as president of the British Medical Association, Mr. G. Northcroft's election as president of the British Dental Association, and Prof. William Bulloch's appointment as chairman of the Lister Institute. The entry to the medical college, he said, was very good, and the entry from Cambridge a record since the war. As to sport, the London had done well in inter-hospital shooting and sailing. (Laughter.) But in Sir Henry's opinion the golden age of the hospital was 1895–1905 when L. A. Smith and Hugh Rigby were R.R.O.'s (and evidently made the most of it). Returning to the present, he said that there would soon be plenty of room for men with little capital to start practice in the country districts of Australia, where life was no longer lonely. In London he had been interested in noting the centrifugal migration of the population and thought that the great hospitals should buy sites cheaply while they could and should move with the tide of humanity outwards to sunlight and fresh air.—Mr. Russell Howard said he had refused to speak (1) because he was a tongue-tied and almost inarticulate Englishman and (2) because he had a life-long grudge against the chairman. In the days when there was but one surgical registrar (a ewe lamb, not a flock) they were rivals for the post and Newland got it. But the real trouble was that Newland then withdrew to Australia and left him to his registrarship and thereafter to a bare existence teaching the obvious to the incompetent. But for this he might have been a successful practitioner with a lock-up surgery. Mr. Howard, nevertheless, admired Sir Henry profoundly because he was one of the few Australians who had returned to their country; because he had never called himself Simpson-Newland; and for other reasons. The fact that he was second president of the Royal Australasian College of Surgeons spoke for itself.

Mr. Hugh Lett then made an impressive appeal for funds for the new students' hostel. This was urgently needed, he said, because even the sons of old Londoners were going elsewhere for lack of the corporate life which was of such immense importance in training for medical practice. The original estimate of £50,000 had been reduced to £23,000; £6000 had been collected; the house committee had voted a further £3000; and now that the whole of the Philpot-street frontage had become available a beginning was to be made with the north wing. He asked in Lord Knutsford's phrase, that everyone should give as much as he could uncomfortably spare; and in this spirit over £250 was contributed within a quarter of an hour by a few of his hearers.

PARLIAMENT

NOTES ON CURRENT TOPICS

Reassembly of Parliament

BOTH Houses of Parliament reassembled on Tuesday, Oct. 18th, after the summer recess.

The business before the House of Lords was purely formal, and the House of Commons devoted the day to the discussion in committee of Ways and Means of the resolutions in connexion with the Bills which are necessary for carrying into effect the agreements reached at the Imperial Economic Conference at Ottawa.

Major ELLIOT (formerly Financial Secretary to the Treasury and now Minister of Agriculture) and Dr. MORRIS-JONES (who has been appointed an Assistant Government Whip) were among the Ministers who took their seats on the Treasury Bench.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Oct. 24th.—8 P.M., ODONTOLOGY. Mr. A. E. Rowlett: The Gnathodynamometer and its Uses in Dentistry. Mr. J. Draper Cambrook: A Sequestrum of the Palate.
WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Mr. W. Horner Andrews: Presidential address. Prof. Edward Hindle (National Institute for Medical Research): The Ætiology of Feline Distemper. Demonstrations: Prof. Edward Hindle: Isospora Bigemina, a Coccidial Parasite of Dogs. Mr. S. J. Edwards: Crystal Violet-æsculum-iron-blood-agar—a Differential Plating Medium for Mastitis Streptococci.
THURSDAY.—8.30 P.M., UROLOGY. Dr. David Band: Chronic Pyelocystitis with Particular Reference to the Ketogenic Diet Treatment. Other speakers: Dr. D. Melville Dunlop and Mr. I. Lawson Dick.
FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.)

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Oct. 24th.—8.30 P.M., Discussion on Fractures of the Lower Jaw to be introduced by Mr. W. Warwick James and Sir Harold Gillies.

MEDICO-LEGAL SOCIETY.
THURSDAY, Oct. 27th.—8.30 P.M. (at 11, Chandos-street, W.), Sir John Collie: Fraud in Medico-Legal Practice. (Discussion will follow.)

SOUTH-WEST LONDON MEDICAL SOCIETY, Bolingbroke Hospital, Bolingbroke-grove, Wandsworth Common, S.W.
WEDNESDAY, Oct. 26th.—9 P.M., Prof. W. Langdon Brown: Allergy and Some Allergic Diseases.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.
WEDNESDAY, Oct. 26th.—4.30 P.M., Clinical cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields.
MONDAY, Oct. 24th.—5 P.M., Mr. C. P. G. Wakeley: Tumours of the Alimentary Tract. (Museum demonstration.)
FRIDAY.—5 P.M., Sir Arthur Keith: Demonstration postponed.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Oct. 24th, to SATURDAY, Oct. 29th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Series of Lectures on Renal Disease. Tues. at 4 P.M. by Mr. John Everidge: Surgical Aspects of Hæmaturia. (Free to Members.)—MILLER GENERAL HOSPITAL, Greenwich, S.E. Second week of the Course in General Medicine and Surgery. All day, demonstrations, operations, and lectures. Specially suitable for general practitioners.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Clinical instruction daily at 2 P.M. and 6 P.M. Lectures on Tues. and Thurs. at 5 P.M.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. All day course in Diseases of the Ear, Nose, and Throat.—LONDON LIGHT CLINIC, Ranelagh-road, S.W. Lecture demonstration on Physical Medicine, Mon. and Wed., 8 P.M. to 9 P.M.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Diseases of Children. Mornings only.—CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C. Week-end Maternity Course. Sat. and Sun. All day.—10, BEDFORD-SQUARE, W.C. Dr. A. Knyvett Gordon will give a demonstration on Clinical Pathology (Epidiascope and Laboratory Demonstrations) on Wed., at 8.30 P.M. (Specially suitable for M.R.C.P. Candidates).—These Courses are open only to Members of the Fellowship.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.
MONDAY, Oct. 24th.—10 A.M. to 12 noon, Skin Department, Surgical Wards. 2 to 4 P.M., Medical, Surgical, Eye, and Gynæcological Out-patients, Surgical Wards. 4.15 P.M., Lecture, Mr. Sangster Simmonds (Surgical).
TUESDAY.—10 A.M. to 12 noon, Medical Demonstration, Surgical Demonstration. 2 to 4 P.M., Medical, Surgical, and Throat Out-patients. 4.15 P.M., Lecture, Mr. Hamblen Thomas: Bronchoscopy and Œsophagoscopy.
WEDNESDAY.—10 A.M., Medical Wards, Childrens' Out-patients. 2 to 4 P.M., Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases Demonstration.
THURSDAY.—10 A.M. to 12 noon, Neurological Department, Fracture Demonstration. 2 to 4 P.M., Medical, Surgical, Eye, and Genito-Urinary Out-patients.
FRIDAY.—10 A.M., Medical Wards, Skin Department. 2 to 4 P.M., Medical, Surgical, and Throat Out-patients.
SATURDAY.—10 A.M., Medical Wards, Childrens' Out-patients, Surgical Wards.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL POST-GRADUATE SCHOOL.
WEDNESDAY, Oct. 26th.—3 P.M., Sir Ernest Graham-Little, M.P.: Voluntary Hospitals and their Future.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, Oct. 27th.—3 P.M., Dr. Blake Pritchard: Peripheral Neuritis (demonstration).

ST. PETER'S HOSPITAL FOR STONE, POST-GRADUATE COURSE, Henrietta-street, Covent Garden, W.C.
MONDAY, Oct. 24th.—10 A.M., Dr. John Roth: X Ray Demonstration. 2 P.M., Mr. Swift Joly: Operations.
TUESDAY.—10 A.M., Mr. F. J. F. Barrington: Treatment of Stricture and its Complications. 2 P.M., Mr. F. J. F. Barrington: Operations. 4 P.M., Mr. Alban Andrews: Out-patient Demonstration.
WEDNESDAY.—11 A.M., Dr. Cuthbert Dukes: Pathological Museum Demonstrations. 3.30 P.M., Mr. A. H. Harkness: Non-specific Urethritis. 5 P.M., Mr. A. H. Harkness: Out-patient Demonstration.
THURSDAY.—10 A.M., Mr. Clifford Morson: Rôle of Radium in Genito-Urinary Cancer. 11 A.M., Wards. 2 P.M., Mr. Ogier Ward: Operations.
FRIDAY.—10 A.M., Mr. Ogier Ward: Cystoscopy in the Female. 2 P.M., Mr. Clifford Morson: Operations. 4 P.M., Mr. Alban Andrews: Out-patient Demonstrations.
SATURDAY.—10 A.M., Mr. Swift Joly: Stone in the Upper Urinary Tract. 11 A.M., Wards. 2 P.M., Mr. J. Sandrey: Out-patient Demonstration.

NATIONAL HOSPITAL, Queen-square.
MONDAY, Oct. 24th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Cranial Nerves and Special Senses.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Cranial Nerves and Special Senses.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic. 3.30 P.M., Dr. Collier: Clinical Demonstration.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Cranial Nerves and Special Senses.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: The Psychoneuroses.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Oct. 26th.—4.30 P.M., Mr. Claude H. Mills: Interesting Urological Cases. Specimens, &c.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Oct. 27th.—9 P.M., Dr. C. Newman: Dysfunction of the Gall-bladder.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Oct. 26th.—4 P.M., Dr. H. J. Churchill: Anæsthetics in General Practice.

ROYAL INSTITUTE OF PUBLIC HEALTH, Queen-square, W.C.
WEDNESDAY, Oct. 26th.—4 P.M., Dr. Chalmers Watson: Food and Problems of Nutrition in Regard to Preventive Medicine.
THURSDAY.—4 P.M., Prof. R. J. A. Berry: Opens discussion on Mental Defectiveness: Medical and Social Considerations.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Oct. 26th.—5.30 P.M. (at 11, Chandos-street, W.), Dr. W. Brown: Rationalisation.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Oct. 25th.—5 P.M., Dr. A. M. H. Gray: Xanthoma. Herpes.
THURSDAY.—5 P.M., Dr. K. Sibley: Principles of Treatment. Local.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE THROAT AND CHEST, Hardman-street, Deansgate.
WEDNESDAY, Oct. 26th.—4.30 P.M., Mr. E. S. Burt Hamilton: Nasal Suppuration.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Oct. 25th.—4.15 P.M., Mr. D. L. Sewell: Cancer of the Larynx and its Treatment by Radium.
FRIDAY.—4.15 P.M., Dr. T. H. Oliver: Demonstration of Medical Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Oct. 27th.—4.15 P.M., Mr. P. G. McEvedy: Carcinoma Colon.

NOTES, COMMENTS, AND ABSTRACTS

DELAY IN SEEKING RADICAL TREATMENT FOR CANCER

WORDS TO THE LAITY AND THE LEARNED

BY PROF. P. BULL, M.S. OSLO

ALL doctors know that patients suffering from cancer may be cured if only they are given radical treatment at the beginning. Some of the public also know this; and yet patients suffering from cancer are seldom put under treatment in an early stage of their illness. This is especially true of cancer of the internal organs, which forms the great bulk of all cancer.

What is the cause of this regrettable state of affairs? It may easily be thought that the fault lies with the doctors who have not the ability to diagnose the disease in an early phase. Apart from this, however, the following circumstances mainly prevent an early recognition of cancer: (1) wrong popular ideas of cancer; (2) its insidious progress in the early stages; and (3) the differing attitude of different people towards cancer and the possibility of it.

Many people, perhaps most, are fully convinced that cancer is an incurable disease, which it is no use to fight against. Most people believe that cancer is a painful disease accompanied by an appearance of illness, by ulceration, and by foul discharge. This picture undoubtedly fits many forms of cancer in an advanced phase, but does not at all conform to that of cancer at its outset, when it is very often not accompanied by pain, or any pain there may be is so slight that the patient does not believe it to be of any importance. This idea of pain is so deeply rooted in the public mind that patients often say, "But I cannot be suffering from cancer with no worse pain than this." Nor are any other alarming and characteristic symptoms found at the onset of the disease. It is not accompanied by any inconveniences other than those which may be found in any common and benign disorder. It is not unusual to find a patient suffering from cancer weighing about 90–100 kg. and looking blooming.

Since cancer in the early stages steals upon the patient, it is clear that different people will react to such vague and indefinite symptoms according to their character, according to their prejudices about cancer—in fact, according to their whole view of life. Let us take a few examples.

Various People

Those afraid of doctors.—Those who do not dare to consult a doctor lest their suspicion of cancer be confirmed prefer to go on in uncertainty. The fear of an operation contributes to their attitude, for most people know that operation will probably be proposed if they have cancer. Fear prevents these patients from thinking quietly and soberly; they try to conceal their disease until it is clear both to themselves and to those around them that it has become a question of health and perhaps of life. When they do see a doctor the time for cure has passed, and yet they demand that the doctor shall cure them, and are by now willing to submit to any operation, even if the prospect of a good result is minimal. So in the end it proves not to have been the fear of doctor or operation which held them back, but the fear of death, and it is this fear that makes them an easy prey to the man with the scythe.

If such a patient had at once sought skilful help the doctor might have said: "You are not suffering from cancer." Thereby he would have got rid of an unnecessary anxiety—quite a pleasant result of a consultation. Or the doctor might have said: "This looks doubtful, I cannot say anything without further examinations, which will last a few days." After some anxious days the doctor might have reached the same conclusion: "You are not suffering from cancer." Or he might have said: "I am sorry, but this looks serious, and an operation or treatment by rays is necessary"; but he would have added: "You will probably be quite all right, because you have consulted me in an early phase of your disease."

Those afraid of cancer, the cancerophobes, are quite different. They do not think and do not talk of anything but cancer; at the slightest pain or inconvenience they consult the doctor, and insist that they have a lump in the breast, a sore tongue, and so on, though the doctor cannot find anything wrong. Discontented at his failure they go from one practitioner to another—unhappy creatures, whom we may pity, but they are not suffering from cancer.

Quiet and considerate patients do not at once consult the doctor if they feel some vague pains somewhere, as long as they are fairly fit for work. They think that they must work and earn their livelihood; or they have perhaps just started a new enterprise, where their daily presence is needed; or they have started some special work which must be completed. Perhaps they vaguely feel that everything is not as it ought to be, but resolve when they have finished this or that they will consult the doctor. This commendable energy may often prevent an early acknowledgment of disease.

The optimists know, perhaps, that after the age of 40 or 50 many people die from cancer, but for themselves they may be compared to the soldiers in war: they see their comrades fall, but they always imagine that they themselves will go free. They support this idea by some very plausible arguments: they have all their lives been perfectly sound and healthy and they belong to a family with many examples of longevity. They have always lived a sober life, observing all the rules of health. They seem to think it a terrible injustice that they should get cancer. But the optimists must remember that cancer is merciless and makes no distinction between just and unjust, between rich and poor, between excellent people and rogues, or between sound people and infirm ones; and cancer always comes as a surprise and an inconvenience.

Those feeling impelled to explanations.—Some people suffer from a woeful need to hide their ignorance by explanations of all the phenomena of life, and, worst of all, this satisfies them better than anything else. When these people are ill they always have an explanation ready. Pains are "only rheumatism"; pain or discomfort caused by food is "only indigestion." They are fully convinced that they will get all right again, "they know themselves well enough," and so on. If they feel a lump somewhere, it is only the consequence of a blow that hit them just there a fortnight or so ago. These people, with their self-made explanations, are difficult to treat, and if they get cancer they very often do not consult the doctor until they begin to lose their ability to work and their spirit. When the doctor tells them the real cause of their rheumatism, indigestion, or lump, they are much surprised and raise objections.

The fanatics, through religious conviction or mere stupidity, maintain that diseases do not exist, or in any case that it is unnatural to be treated by a doctor. If these people get cancer they always come too late: they will not consult the despised doctor until "spiritualism" and all sorts of "natural methods" have robbed them of the favourable moment.

Unfortunate advice from relations and friends is another obstacle to early acknowledgment of cancer. When the patient complains of discomfort after food, irregular bowels, irregular bleeding, or indefinite pains, there is always someone who knows an excellent remedy for just that disease. These benevolent

people recommend the remedy, and take the responsibility upon themselves without having any idea that they are preventing their friend or relative from consulting a doctor. Or they advise him to consult a quack, who, for much money, gives him some worthless herb or ointments, and meanwhile the precious time passes away.

The Educational Campaign

Doctors often find themselves in a difficult position when asked to say whether or not a patient is suffering from cancer; we must, however, confess that it is sometimes just as difficult to be the patient. If he consults the doctor when he has an advanced cancer, he is reproached for indifference to his health; and if the doctor does not find anything, his relations and friends accuse him of being afraid and consulting doctors in season and out of season.

The obstacles in the way of an early recognition of cancer are partly due to its insidious development and partly to human faults and virtues, and that is why these obstacles are so difficult to overcome. It is tempting to stop all propaganda, especially as it may cause an exaggerated fear among unbalanced people and turn them into cancerophobes. We hope, however, that educational measures about cancer may help somebody to be properly treated in due time, especially when these measures are concentrated on the points that experience shows to be the public's weak side. The main thing is, by constant repetitions, to hammer the following points into the public mind:—

(1) Cancer is no incurable disease; it can be fully eradicated when treated early.

(2) For the time being we know only two methods for the radical treatment of cancer: operation and X rays or radium, separately or combined.

(3) Cancer often begins without pain or with very slight pain.

(4) Cancer at the onset causes no other symptoms than those following any insignificant disease of the same organ.

(5) Indigestion is not a disease, but a painful symptom produced by many possible diseases, both within and outside the abdominal cavity—e.g., ulcer of the stomach, gall-stones, appendicitis, intestinal diseases, and diseases of the internal sex organs; it may also be due to cancer of the stomach, intestines, liver, and kidneys.

(6) Cancer is so common after the age of 40–50 that everyone must consider the possibility of getting it, even if his previous health has been of the best.

(7) The worst thing that can be done by one who imagines himself to be suffering from early cancer is to give up hope at once and hide the disease, instead of consulting the doctor in time.

THE HOSPITALS OF AMSTERDAM

IN Amsterdam, as in England, the function of hospitals during recent years has undergone a fundamental change; at one time the refuge of those who could afford no other care, they have gradually become centres of first-class treatment and equipment, and have begun to draw patients from all classes of society. Dr. J. L. C. Wortman, in an account of the Amsterdam hospitals,[1] writes with regret of the delays which have attended the development of the municipal hospital system in Holland. Repeated schemes have been agreed upon, only to be discarded. "No more striking example can exist," Dr. Wortman remarks sadly, "of the unreliability of the decisions of municipal councils." Nevertheless, two of the oldest hospitals in Amsterdam are municipal. One of these, the St. Elisabeth Gasthuis, was founded in the fourteenth century, and was later combined with the St. Peter Gasthuis, built by a fisherman's guild, a hospital which, besides being provided with a pest-house, gave temporary lodging to vagabonds and homeless persons. A discouraging offer of hospitality was carved over the entrance:

> "Three nights, not longer,
> I lodge who need it;
> The fourth I keep out
> The beggars and the knaves."

Later, in the sixteenth century, the patients of the St. Peter's Gasthuis were removed, bag and baggage, to a block of convent buildings which had been appropriated by the city government, and which were to provide the site of the present hospital. In the seventeenth century a new pest-house was built outside the city, and the plague cases no longer shared the same buildings as other patients; the two hospitals became known as the Inner and the Outer Hospitals. The Outer Hospital was replaced by a new building, the Wilhelmina Hospital, in 1885, and it is significant that even at that time a section was included where private patients could be treated, who would provide a source of income to the hospital. The Inner Hospital has never been completely rebuilt, but has suffered piecemeal reconstructions and additions. The Wilhelmina Hospital is now to become a complete university institution, and is undergoing reconstruction for that purpose. Dr. Wortman remarks that in the pavilion for infectious cases at the Wilhelmina Hospital, "during visiting hours, thick ropes are stretched from each side of the door across the ward, so that visitors can walk along the beds looking at the patients without coming into contact with them." This arrangement is more sociable than observation through a glazed partition, more usual elsewhere, and it would be interesting to learn if it has proved free from the risk of infection in either direction. A third municipal hospital is the Tesselschade, which began as a temporary institution, but which soon became a much-needed permanency.

In addition to the municipal hospitals, Dr. Wortman describes the private hospitals of the city. The Holy Virgin Hospital, built in 1898, was at that time equal to the best institution of its kind in Europe, and has kept pace with modern developments. Many other general and special institutions are described in a work which appears to give a complete account of hospital facilities in Amsterdam.

[1] De Amsterdamsche Ziekenhuizen. By J. L. C. Wortman, M.D., formerly superintendent of the university clinics in Utrecht, of the Municipal Medical Service, and of the Tesselschade Hospital in Amsterdam. Lochem, Holland: N. V. Algemeene Periodieken Maatschappij. 1932. Pp. 169. 16s.

CONSTIPATION WITH INCONTINENCE

IN 1923 I. Thorling described a condition which he called constipation incontinence. His three patients, boys between the ages of 6 and 7, suffered from incontinence of the bowels which he attributed to constipation. His suggestion that such incontinence might prove not to be uncommon, is confirmed by Dr. C. E. Bloch,[1] of Copenhagen, who states that though the text-books do not yet mention this disorder, he has lately observed as many as seven cases. All his patients were children over the age of 7; and they were otherwise perfectly normal and well developed. All had previously had normal control over the bowels. The incontinence had developed gradually, at first only during the day. Later it became more frequent and occurred also at night. It would occur when the children were greatly excited over their exercises and games, and they were unaware of what had happened till the stools were actually in the clothing. One of the most distressing cases was that of a boy between 7 and 8, a pupil in the ballet school of the Royal Theatre, Copenhagen. While he was on the stage, brown spots would appear on the back of his white tights—a display which led to his dismissal. On admission to hospital he was found to be miserable and ashamed. The sphincter of the anus was somewhat relaxed, and the rectum was filled with fæces even immediately after the bowels had acted. In only one of the seven cases was the involuntary action of the bowels accompanied by enuresis; and

[1] Acta Med. Scand., August 29th, p. 248.

in this respect constipation incontinence seems to differ from the ordinary distraction incontinence of small children, and from the incontinence of mentally defective children. All seven patients had been subjected to severe discipline, most of them had also been under medical treatment, and a few had been treated in hospital without a correct diagnosis being made or a cure effected. The severe discipline these children had undergone had made them quiet, timid, and ashamed. It is probable that bad habits constituted the chief cause of this complaint, the children getting accustomed to suppress the call to defæcate when at play or work. The treatment consisted of an ordinary diet supplemented by 15 to 30 c.cm. of liquid paraffin taken daily. Every day, at a certain hour, the children were made to sit on the chamber, with their feet on the floor, so that they could apply the maximum of abdominal pressure. When as much fæces as possible had thus been evacuated, a glycerin enema was given. Early in the treatment it yielded large quantities of fæces; later the glycerin enema, usually undiluted, was given only every second or third day. In every case complete success followed this treatment.

NEW PREPARATIONS

WE have received from Messrs. Burroughs Wellcome and Co., Snow Hill Buildings, London, E.C., three preparations: (1) Iodised "Moogrol"; (2) Stipolac; (3) Concentrated liquid liver extract.

(1) IODISED "MOOGROL."—This preparation for the treatment of leprosy is a mixture of esters of the acids of the chaulmoogric series combined with 0·5 per cent. of iodine. The addition of the iodine is designed to reduce—and succeeds in its object—the irritating properties of the ethyl esters. Preliminary clinical experience confirms that Iodised "Moogrol" is less irritating than plain "Moogrol." At a conference on leprosy, held at Manila in January, 1931, the use of iodised esters, particularly by the intradermal method, was strongly recommended. The method has been employed by the Philippine workers for some years, and the advantages claimed are that it produces a more rapid resolution of the superficial lesions and that it is relatively free from general and local reactions. Iodised "Moogrol" is issued in bottles of 25 c.cm., 100 c.cm., and 1 litre.

(2) STIPOLAC.—This is a preparation for use in the radiographic examination of the gall-bladder, to which the name "Stipolac" Brand Sodium Tetraiodophenolphthalein is given. The product is supplied in two tubes containing (1) "Stipolac" Brand Sodium Tetraiodophenolphthalein, and (2) "Stipolac" Brand Acid Mixture respectively. The contents of the two tubes are to be mixed before administration.

(3) CONCENTRATED LIQUID LIVER EXTRACT is intended to supplement, or replace the whole of, the amount of fresh liver in a daily diet. It is a palatable product, can be taken over long periods, and is issued in bottles of 4 and 16 fluid ounces, 1 fluid ounce containing the equivalent of 8 ounces of liver.

GLUCATOR.—This apparatus for the quantitative estimate of sugar in the urine is supplied by Messrs. H. R. Napp, Ltd., 3 and 4, Clement's-inn, Kingsway, W.C. It is packed in a neat and handy manner and is designed to enable the practitioner to make an accurate quantitative estimation of sugar in the urine in two or three minutes. Very clear instructions for its use are included in the case, as well as colour charts which show the successive tints of the reagent on the addition drop by drop of the urine of a diabetic patient. We can see that the apparatus should be of considerable practical service.

HALIBUT LIVER OIL, COLLOSOL BRAND.—We have received from the Crookes Laboratories (Gorst-road, Park Royal, London, N.W.) this preparation described as a natural concentrate giving 50 times the vitamin A value of the finest cod-liver oil. Halibut oil has been shown to have a high vitamin A content, but its extraction is attended with laboratory difficulties over which the firm state that they have triumphed. It should be added that the preparation is stated to contain a definite quantity—namely, 2000 international units per gramme—of vitamin D.

THE HUMOUR OF MEDICINE

COLLECTIONS of stories illustrating the humorous side of medical practice have appeared before, while in all old jest-books the medical anecdote figures prominently, and is regularly reproduced in modern journalism, touched up to meet topical situations. We have received from *Rinascenza Medica* an Italian compilation in which we find many new and some good jokes, appearing side by side with some old and many poor jokes. The illustrations are also mixed in quality, those reproduced from Italian newspapers being particularly woolly. But for the sake of the better part of the collection "Il Medico si diverte" is worth perusing, and it can be got at 3, Cesario Console, Naples, in return for L.40.

AS OTHERS SEE US

THE *Siècle Médical* for Oct. 15th, under the heading "English hospitals in the search for resources are to institute a lottery in a continental country to tap foreign money, lotteries being forbidden in Great Britain," pictures the situation in the following words: "English hospitals are in a terrible crisis; for private subscriptions, in spite of considerable publicity in the press, are diminishing, and the boards of managements are much disturbed. It is known that, generally speaking, English hospitals are supported solely by private charity, the only State or municipal organisations being some defective enough consultation services and a system of assistance by the 'workhouses,' which partake more of the prison than of the hospital. Nothing in England resembles our powerful and benevolent *Assistance publique*."

IRISH NATIONAL HEALTH INSURANCE COMMISSION.—In p. 864 of our last issue, in referring to the National Health Insurance Commissioners of the Irish Free State, the name of Mrs. Alfred Dickie was inadvertently given as Mr. Alfred Dickie.

Appointments

PARRY, RUPERT, M.B., B.S. Lond., has been appointed Honorary Assistant Ophthalmic Surgeon to the Cardiff Royal Infirmary.

East London Child Guidance Clinic, Bell-lane, E.: P. LIONEL GOITEIN, M.B., B.S. Lond., D.P.M. Lond., Hon. Asst. Psychiatrist. AMY M. THOMS, M.D. St. And., M.R.C.P., Hon. Assistant Psychiatrist.

Births, Marriages, and Deaths

BIRTHS

COTTON.—On Oct. 8th, at Whitecross-road, Hereford, the wife of Dr. O. J. C. Cotton, of a daughter.

MACDONNELL.—On Oct. 15th, at 5, Upper Mount Street Crescent, Dublin (nursing home), to Sheila, wife of J. J. MacDonnell, M.B., of Avoca, Hook, Surbiton—a son.

MARRIAGES

BLAIN—MACLEOD.—On Oct. 15th, at Old Parish Church, Nairn, James Alexander Blain, M.B., Ch.B., to Sheila Louisa, younger daughter of the late John Macleod, I.S.O., H.M.I.S., and of Mrs. Macleod, Fairfield, Nairn.

PEIRCE—THOMPSON.—On Oct. 15th, in London, George Edward Graves Peirce, M.B., to Mrs. Emmita Thompson, of Wimpole-mews, W.1.

DEATHS

BAILEY.—On Oct. 10th, suddenly, at Rugby-road, Brighton, Henry James Bailey, M.B., C.M., aged 67 years.

BRIDGER.—On Oct. 10th, at Royal-terrace, Southend-on-Sea, Sydney Bridger, M.R.C.S., L.R.C.P., aged 60 years.

JENKINS.—On Oct. 10th, at High Oaks-road, Welwyn Garden City, Herbert Thomas Jenkins, M.R.C.S., L.R.C.P.

PRITCHARD.—On Oct. 14th, at a London hospital, Edward J. Pritchard, M.R.C.S. Eng., L.R.C.P., late of West Side, Wandsworth Common.

SYED.—On Oct. 14th, at King's College Hospital, London, after a very short illness, Hassan Syed, M.R.C.S., L.R.C.P., aged 32.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.